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<p>(54) Title: BAGS OF EASY OPEN CONSTRUCTION</p> <p>(57) Abstract</p> <p>A plastic bag includes a mouth which is covered by a closure flap. The closure flap may be peeled back in order to open the bag, without damaging the wall of the bag in or at which the mouth is formed. The closure flap is preferably attached to the bag by means of a peelable adhesive and preferably includes lines of weakness along which the closure flap may be torn. Variations of the bag include a base portion which includes a flat area on which the bag may stand stably.</p>			

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**BAGS OF EASY OPEN CONSTRUCTION**

The present invention relates to bags or sacks, and in particular to plastic bags or sacks having an improved  
5 easily openable construction. The invention relates additionally to such bags or sacks which are able to stand stably and unsupported.

The bags of the present invention may be of any suitable size from relatively small (eg about 1 litre capacity or  
10 less) to large sacks and are very useful for, for example, industrial processing uses within and between factory premises, or for transporting food products between factory and retail premises, most especially for the food processing industry. The bags of the invention  
15 may also be suitable as the external packaging of certain solid and liquid consumer products (such as detergents). The bags may also find application in home delivery services, especially where it is sometimes necessary to return products by post to a supplier.

20 Plastic bags of many different types are known, but one particular problem has been in providing bags which incorporate an easily openable closure and which are easily and relatively cheaply manufactured, easy and reliable to use and, for some uses, suitable for  
25 containing relatively heavy materials. The present invention seeks to provide a bag which has a closure capable of meeting these requirements. The present invention further seeks to provide a bag which is additionally capable of standing upright and in a stable  
30 manner on a surface, especially while containing a

product which may, in particular uses, be a relatively heavy product

The bags of the present invention are particularly suitable for containing bulk products in the form of 5 powders, granules or liquids. Examples of such products include bulk chemicals and bulk ingredients such as are used in human and animal foodstuffs and in household products such as washing powders and washing liquids; foodstuffs such as prepared or partially prepared foods; 10 household products; and garden products such as peat or compost. In the food industry, plastic bags and sacks are especially used in the transport of food, ingredients or partially prepared food products around or between premises. In the context of this specification, bulk 15 product may include retail consumer products such as liquid and solid detergents, dry foods, food ingredients and prepared foods for which the bags of the invention may form the external packaging. The quantity of the bulk product which the bag is adapted to contain will 20 vary with the particular use and, for example, for prepared foods, the quantity may not be very large.

The present invention also relates to bags or sacks, and in particular to plastic bags or sacks which are able to stand stably on a surface when containing a solid or 25 liquid product including in particular a relatively heavy product.

Accordingly, the present invention provides in a first aspect a plastic bag comprising:

first and second side walls which together form a bag portion having front and rear faces;

a mouth formed at the front face of the bag for access to the interior of the bag; and

- 5 a closure flap overlying and closing the mouth and having a region which is peelably attached to the front face;

wherein at least a portion of the closure flap may be peeled away from the front face across the peelably attached region to reveal the mouth, such that the front

- 10 face remains functionally intact.

In one variation of this aspect of the invention the portion of the closure flap which may be peeled away from the front face is defined by at least one line of weakness extending through the peelably attached region

- 15 and along which the closure flap is torn to expose the mouth of the bag.

An alternative, second, aspect of the invention provides a plastic bag comprising:

first and second side walls which together form a bag

- 20 portion having front and rear faces;

a mouth formed at the front face of the bag for access to the interior of the bag;

and a closure flap overlying and closing the mouth and having a region which is attached to the front face;

- 25 wherein the closure flap includes at least one line of weakness defining a portion of the flap which does not

include any part of the region which is attached to the front face and which portion can be opened by tearing along the line of weakness to expose the mouth of the bag.

- 5 In one embodiment of these aspects of the invention the closure flap includes a line of weakness in the form of an arc extending from points on the closure flap proximate the mouth towards an end edge of the closure flap.
- 10 In order to facilitate opening of the bag, the bag preferably includes at least one finger hole formed in the closure flap on the above line of weakness by means of which the closure flap may be gripped for tearing.  
In another embodiment of these aspects of the invention  
15 said portion (that is, the peelable portion of the first aspect or the portion defined by at least one line of weakness of the second aspect) is defined by at least two lines of weakness in the closure flap along which the closure flap is torn to expose the mouth of the bag.
- 20 Preferably in this embodiment the lines of weakness terminate in one or more finger holes formed in the closure flap, by means of which the closure flap may be gripped for tearing. This construction facilitates opening of the bag.
- 25 In an alternative preferred construction according to the first aspect of the invention in the above embodiment the lines of weakness extend from an end edge of the closure flap to points proximate the mouth.

Other possible constructions for the lines of weakness and the closure flap include the following:

the lines of weakness may be substantially straight and substantially parallel to the edges of the bag; or

- 5 the ends of the lines of weakness at the end edge of the closure flap are spaced further apart than the ends of the lines of weakness proximate the mouth; or

the ends of the lines of weakness at the end edge of the closure flap are so spaced apart as to define a finger

- 10 tab by means of which the closure flap may be gripped for tearing; and/or

the closure flap is sealed to the front face along portions of its end edge extending from respective lines of weakness to the sides of the bag.

- 15 In one particularly preferred construction, the line or lines of weakness are so shaped that the portion of the closure flap defined thereby adopts the shape of a dispensing spout when torn along the line or lines of weakness.

- 20 In a particularly preferred embodiment of the first aspect of the invention the portion of the closure flap which may be peeled away is attached to the front face by means of a peelable adhesive. A hot melt adhesive is particularly preferred. Alternatively, the portion of
- 25 the closure flap which may be peeled away may be attached to the front face by means of a peelable heat weld or peelable heat sealed region.

In particularly preferred embodiments of the invention, the lines of weakness are perforations formed in the closure flap. Alternatively, the lines of weakness may comprise lines where the material of the closure flap is  
5 made thinner, or scored lines in the material of the closure flap.

In a particularly useful embodiment of the invention, the plastic bag further comprises a closeable region formed at a first end of the bag for closing the bag after  
10 filling. This construction allows the bag to be filled from the same end as the easy-open portion and for that end to be sealed after filling. Also, other advantageous constructions may thus be formed at the other end of the bag, especially constructions which will not permit  
15 filling of the bag from that other end. The closeable region may be closed by any suitable means. Examples of suitable means for closing the closeable region include heat sealing, adhesive (eg an adhesive layer initially covered by a removable protective tape) and snap-fit  
20 fastening means such as those extending along the width of the closeable region and comprising a male component on one side and a female component on the other which components snap together to form a closure.

A further preferred embodiment of the invention provides  
25 that the first side wall forms the front of the bag, and the second side wall forms the rear of the bag, the said side walls being of substantially the same length.

In a preferred construction according to this embodiment the mouth comprises a slit formed in the front face.

Alternatively, the bag may comprise a further line of weakness, formed in the front face, which line of weakness may be ruptured to form the mouth.

The closeable region may include end parts of the first 5 and second side walls. These end parts may, for example, be heat sealed to close the bag after filling. In some constructions the closeable region may further include an end part of the closure flap, which may then also form part of the heat seal (or other closure means).

10 In an alternative preferred embodiment the first side wall forms the front of the bag, the second side wall forms the rear of the bag and the second side wall has an extension beyond the bag portion. This extension can then cooperate with the closure flap and the first side 15 wall in defining the mouth and forming the easily openable closure. Thus, preferably, the closure flap overlies a part of the first side wall and said extension of the second side wall.

In this way, the mouth is defined by the end edge of the 20 first side wall and the said end edge is revealed when the closure flap is peeled back, thereby allowing access to the interior of the bag.

In this construction preferably also the closeable region includes the extension of the second side wall and an end 25 part of the closure flap.

Handles for carrying the bag may be formed in or near (for example, just above) the closeable region, such as by cutting, punching or otherwise forming suitable holes in the first and second side walls, the extension to the

second side wall or the closure flap (as appropriate for the particular construction). Alternatively, separate handles may be attached to, or near, the closeable region.

- 5 In one more particularly preferred embodiment of the above aspects of the invention the bag further comprises a second flap depending by means of a boundary fold from an edge of the mouth and extending into the interior of the bag.
- 10 Most preferably, the second flap is attachable by means of an adhesive to the inside face of the second side wall. Desirably, said adhesive is a peelable adhesive.

A further preferred embodiment of the first aspect of the invention provides that on the portion of the closure flap which may be peeled away, any path extending from the boundary of the said portion nearest to the mouth to the boundary of the said portion distant from said mouth must pass through a peelably attached region.

Also, in another preferred embodiment of the first aspect of the invention a path along the first side wall substantially parallel to and adjacent to the mouth lies entirely in a peelably attached region, at least within the peelable portion of the closure flap. These embodiments ensure that there is an uninterrupted seal (by means of the peelable adhesive) across the whole width of the peelable region so that, for example, there is no route by which powder or liquid product may escape through the easy-open closure.

In use of the bags of the invention it is advantageous for the bags to be able to stand stably and unsupported during and after filling. Accordingly, one much preferred embodiment of the invention provides that the 5 bag further comprises a base portion formed at an end of the bag distant from the closeable region and operative to provide a substantially flat region on which the bag may stand stably.

In a preferred construction according to this embodiment, 10 the base portion comprises:

a base panel connected along opposing sides thereof to the respective first and second side walls by means of first folds, said panel further having a second fold, co-extensive with the width of said side walls and 15 substantially parallel to said first folds, said second fold dividing the base panel into first and second panel leaves, such that the second fold and the panel leaves lie between said side walls with the external faces of the panel leaves towards each other; and

20 mitre seals comprising a seal line extending from each end of said second fold to each first fold, along which seal lines the first and second side walls are respectively joined to the base panel.

The mitre seals form mitred corners which may be removed 25 if necessary in order to improve the palletisation of the bag, but this is not essential. That is to say, the bags of the present invention may be required to be suitable for transportation on a pallet and in order to retain the bags on the pallet a number of bags comprising a pallet

load are often shrink wrapped (or otherwise wrapped) on the pallet. In bags of the prior art (without a stable, flat base), in the absence of mitre seals, product contained in the bag is able to fill the bag right into 5 the corners. This makes the corners stiff and sharp so that the corners will tend to cut or tear the shrink wrapping and/or adjacent bags. Thus some prior art bags (without the flat base construction according to the present invention) have included mitre seals at the 10 corners, to prevent product from passing right into the corners. In this way, the corners, although still sharp, are flexible and less likely to cause damage. In the present invention, the mitre seals are an integral part of forming the flat stable base, but may also serve to 15 add flexibility to the corners for improved palletisation. Removing the mitred corners can provide a further improvement in palletisation, but is not essential. Similarly, where the bags of the invention form the external packaging of consumer products, the 20 mitred corners can be removed to avoid sharp corners which are inconvenient to the consumer and to allow the bags to be more easily stacked on the shelves of shops and supermarkets.

The preferred construction according to the invention 25 where the bag includes a flat, stable base portion may alternatively be defined with the bag in its expanded condition for filling. Thus, in this construction the base portion comprises a generally rectangular base panel having opposed side edges and opposed end edges and 30 generally triangular end wall portions each depending along a base side thereof from a respective end edge of

- the base panel, said base panel being connected to the respective first and second side walls by means of first folds coincident with said respective side edges, said triangular end wall portions having an apex positioned in  
5 use above said base panel, and having side edges comprising seal lines extending between said apex and respective corners of said base portion along which the first and second side walls are respectively joined to the said end wall portions.
- 10 In both the former and the latter constructions, the base panel is preferably, but not essentially, formed integrally with the first side walls.  
In the former and latter constructions according this embodiment, preferably the seal lines (of the mitre  
15 seals) comprise a heat weld.  
Desirably the seal line of the mitre seals (as defined in the former construction) forms an angle of between 30° and 60° with respect to the second fold and more especially the seal line of the mitre seals forms as  
20 angle of 45° with respect to the second fold.  
In embodiments of the invention wherein there is no closeable region and the first and second side walls are of substantially the same length, the mouth may preferably be defined by the end edge of the first side wall. This is preferably achieved by providing that the  
25 closure flap depends from the second side wall. Most preferably the closure flap is formed integrally with the second side wall and depends from the second side wall along a fold. This fold is thus most preferably

substantially parallel to and adjacent to the end edge of the first side wall which defines the mouth.

In constructions of the bag where there is no requirement to provide a stable base, the bag may be constructed so 5 that it is openable also at an end of the bag, separately from the easy-open closure. In this construction, the bag is further provided with a third flap overlying and peelably attached to the first or second side wall, which third flap depends from the respective second or first 10 side wall at an end of the bag spaced apart from the closure flap.

In an alternative definition of some of the bags of the first aspect of the invention, the plastic bag comprises first and second confronting side walls having substantially coincident end boundary edges and a closure flap overlying an end region of the first side wall, depending from the end boundary edge of the second side wall, including a first fold substantially parallel to and adjacent to the end boundary edges and having a region which is peelably attached to the first side wall, the first and second side walls being attached along their side edges and wherein at least a portion of the closure flap may be peeled away from the first side wall across the peelably attached region to expose the interior of the bag such that the first side wall remains functionally intact.

In an alternative definition of some of the bags of the second aspect of the invention the plastic bag comprises first and second confronting side walls having substantially coincident end boundary edges; and a

closure flap overlying an end region of the first side wall, depending from the end boundary edge of the second side wall, including a first fold substantially parallel to and adjacent to the end boundary edges and having a  
5 region which is attached to the first side wall; the first and second side walls being attached along their side edges; and wherein the closure flap includes at least one line of weakness defining a portion of the flap which does not include any part of the region which is  
10 attached to the first side and which can be opened by tearing along the line of weakness to expose the interior of the bag.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will  
15 be made (by way of example only) to the following drawings, in which:

Figure 1 is a schematic perspective view of a bag according to one variation of the invention;

Figure 2 is a sectional view along line A-A of Figure 1;

20 Figure 3 is a schematic plan view of a bag according to another variation of the invention illustrating one line of weakness in the closure flap;

Figure 4 is a schematic plan view of a bag according to another variation of the invention illustrating two lines  
25 of weakness in the closure flap;

Figure 5 is a schematic plan view of a bag according to a further variation of the invention;

Figure 6 is a schematic plan view of a bag according to another variation of the invention;

Figure 7 is a section along the line D-D of Figure 6;

Figure 8 is a section along the line B-B of Figure 6;

5 Figure 9 is a plan view of the bag of Figure 5 in an open condition;

Figure 10 is a plan view of the bag of Figure 6 in an open condition;

10 Figure 11 is a schematic plan view of a bag according to another variation of the invention sealable to both ends;

Figure 12 is a sectional view along the line E-E of Figure 11;

Figure 13 is a schematic plan view of part of a bag according to a further embodiment of the invention;

15 Figure 14 is a section along the line A-A of Figure 13;

Figure 15 is a view of a part of a bag according to Figure 13 in an open condition;

20 Figure 16 is a schematic plan view of a bag according to the invention incorporating the base construction of Figures 13 to 15;

Figure 17a is a section along line F-F of Figure 16;

Figures 17b and 17c illustrate variations of the bag of Figures 16 and 17a;

Figure 18 is a schematic plan view of a bag according to

the invention of similar construction to the bag of Figure 16;

Figures 19 to 22 illustrate methods of making bags according to the invention;

5 Figure 23 is a schematic plan view of a bag according to the invention where the mouth is not adjacent an end of the bag; and

Figure 24 illustrates one method of making the bag of Figure 23.

10 In this application, unless indicated otherwise, or unless the context requires otherwise, the bags of the invention are described and defined in relation to their flat condition before filling. That is, the bags are described and defined in a configuration in which the  
15 side walls lie flat against each other with substantially no gap there between. Clearly, as the bag is filled with product, the side walls of the bag become separated and the configuration of the bag is changed.

Figures 1 to 12 illustrate bags of a construction where  
20 the base portion for stable standing is not required. In these figures, the bag 200 comprises a bag portion 200A and a closure flap 205. The bag portion 200A is formed with a first side wall 201 and a second side wall 202. The walls 201 and 202 are confronting in that they lie  
25 one over the other and in these embodiments the side walls 201, 202 are of the same length. Walls 201, 202 are joined together along their side edges 203, 204 by, for example, heat seals (the heat seals along side edges 203 and 204 are not specifically illustrated for reasons

of clarity). In an alternative configuration, the walls of the bag portion may be formed as a tube so that there is no distinct joint or seal along their sides.

- The closure flap 205 overlies an end region of the first side wall 201 and in these embodiments depends from the second side wall 202 at the end boundary edge 206 of the second side wall 202. The closure flap 205 may be attached to the second side wall by means of a joint but in these embodiments preferably the closure flap 205 is formed integrally with the second side wall 202 and depends from the second side wall 202 by means of a fold 207. It can be seen that the fold 207 is then adjacent to and substantially parallel to the end edge 209 of the first side wall 201. (In Figures 2, 7, 8 and 12, the spacing between the first side wall 201, and the second side wall 202, and the closure flap 205 is exaggerated for reasons of clarity). The end edge 209 defines the mouth of the bag 200 when the bag is opened. An optional second flap 208 extending into the interior 211 of the bag 200 is attached to the end boundary edge 209 of the first side wall (ie to the boundary edge of the mouth) by means of a boundary fold 210. The end edge 222 of the second flap 208 is illustrated by a dotted line in Figures 5 and 6.
- The closure flap 205 is adhered to the first side wall 201 by means of a peelably attached region or regions 215. The peelably attached region 215 may take a variety of forms but preferably comprises a peelable adhesive and most preferably a hot melt adhesive. The peelable adhesive may be applied to either the surface of the

first side wall 201 or the surface of the closure flap 205, or to both. Other examples of peelable adhesives may include a pressure sensitive adhesive which comprises two non-tacky components, a first of which is applied to 5 the closure flap and the second of which is applied to the first side wall. When the two components are brought together and pressure is applied, an adhesive bond is formed. Alternatively the peelable adhesive may be a permanent or non-permanent adhesive or solvent adhesive 10 applied to either the surface of the first side wall 201 or the surface of the closure flap 205 or both.

The region or regions of peelable adhesive 215 may be of 15 a number of different suitable shapes. For example, the region 215 may occupy the whole area of the first side wall 201 which lies underneath the closure flap 205, or only a part of that region. Regions of peelable adhesive may be in the form of strips or stripes extending laterally across the first side wall or extending diagonally or in curved (wave-like) paths. The regions 20 of peelable adhesive may also be intermittent across the first side wall.

It is preferred that the region or regions of peelable adhesive are such that it is not possible to trace a path along the surface of the first side wall 201 from its end 25 boundary edge 209 (ie from the mouth) to the edge of the closure flap 213 (ie the edge distant from the mouth) which path does not cross a region of peelable adhesive. Where, as described further below, only a portion of the closure flap is peeled away, the above-mentioned path may 30 apply only to that portion.

It is particularly preferred that a continuous region of peelable adhesive is provided substantially parallel to and adjacent to the end boundary edge 209 of the first side wall 201 (ie adjacent to the mouth), as may be 5 particularly seen in Figure 5. This construction assists in ensuring the integrity of the closure.

The region or regions of peelable adhesive 215 may also be selected to be re-sealable, so that the bag may be re-closed after opening by means of the region or regions of 10 peelable adhesive 215.

For example, the transfer of permanent or non-permanent adhesive, hot melt or solvent adhesive applied to either the surface of the first side wall 201 or the surface of the closure flap 205 or both may also occur on opening 15 the bag thereby allowing the bag to be resealed.

Alternative constructions for the peelably attached region 215 also include the use specific adhesives whose adhesive properties vary according to the surrounding temperature, thereby allowing the bags to be used at 20 extremes of temperature. In some cases, these adhesives may not be peelable at room temperature.

Alternative constructions for the peelably attached region 215 also include the use of adhesives which are frangible.

25 Alternative constructions for the peelably attached region 215 include peelable heat welded and peelable heat sealed regions. In order to provide a peelable heat weld or heat seal, the strength of the weld or seal may need to be weakened to some extent. This may be achieved by

interposing some sort of contaminant between the materials to be welded or sealed. The contaminant may be chosen from a wide variety of materials but examples include inks and lacquers or a third film layer which 5 welds less strongly to the layers of material than the materials weld to themselves.

Referring specifically now to Figures 1 and 2, the illustrated bag may be opened simply by peeling back the closure flap 205 through the peelably attached regions 10 215 to reveal the mouth 221. In this and other embodiments of the invention, where a peelable adhesive is used, the adhesive is selected so that its cohesive strength is less than its adhesive strength. Thus, in the embodiment of Figures 1 and 2, as the closure flap is 15 gripped at its leading edge 213 and pulled, it is separated from the first side wall 201 in the peelable region 215 without substantial damage occurring to the closure flap 205 or to the first side wall 201. Thus neither the closure flap 205 nor the first side wall 201 20 is torn and although each may be somewhat distorted, any distortion of the first side wall 201 is not significant in terms of its function.

In this and other embodiments the optional second flap 208 assists in maintaining the integrity of the closure 25 when the bag 200 is filled with its contents. Second flap 208 is effective in preventing the contents of the bag from penetrating to an excessive extent between the first side wall 201 and the closure flap 205 around the region of the first fold 207, which might otherwise cause 30 distortion the side wall 201 and/or the closure flap 205

so that they could become separated at the peelable region 215. The bag closure could then be breached, allowing the contents to leak or spill.

In particularly preferred variations of the invention the  
5 closure flap 205 is provided with one or more lines of weakness along which the closure flap 205 may be torn in order to open the bag and expose its interior. The lines of weakness preferably take the form of perforations in the closure flap 205.

10 Referring now to Figures 3 and 4, a bag is illustrated incorporating only one line of weakness. The line of weakness 216 is in the form of an arc extending from points W-W near the mouth and the first fold 207 through the peelably attached region 215 towards the edge 213 of  
15 closure flap 205. Line of weakness 216 defines a portion 219 of the closure flap which may be gripped and peeled away by tearing along the line of weakness 216 to open the bag. Preferably, the ends of the line of weakness 216 do not extend beyond the peelable region 215 towards  
20 the mouth in order to preserve the integrity of the closure and to prevent product leakage.

In order to facilitate opening of the bag, the embodiment illustrated in Figure 4 includes a finger hole 250 by means of which the closure flap 205 may be gripped in  
25 order to begin tearing along the line of weakness 216. Alternatively, a tab may be attached at a similar point which tab may be gripped with the fingers to begin tearing. As indicated in Figure 4, a line of permanent adhesive 240 may be provided between end edge 213 of the  
30 closure flap and the line or lines of weakness 216 in

order to assist in retaining the closure flap 205 prior to opening the bag 200.

In an alternative embodiment of the invention to that illustrated in Figure 4 it may be desirable to refrain 5 from the use of adhesive in the region of the closure flap defined by the line of weakness 216. In this case, the closure flap 205 must be sealed to the first side wall 201 (such as by non-peelable adhesive or heat seals) in the area outside the portion 219, in order to provide 10 the necessary closure. For example, this may be achieved by means of the line of permanent adhesive 240 and seals at side edges 205A, 205B.

Referring now to Figures 5 to 10 variations of the bags of the invention are illustrated in which the bags 15 include two lines of weakness 216A, 216B which define a portion 219 of the closure flap which may be peeled away along the lines of weakness to open the bag. Additional features which may be incorporated into other embodiments of the invention are also illustrated. In this respect, 20 the closure flap 205 may be sealed to the first side wall 201 at its end edge 213 by means of seals 212A, 212B (Figure 6) and at its side edges 205A, 205B (Figure 5), but these are not always essential. Seals 212A and 212B are preferably heat seals, however, adhesive seals, 25 utilising permanent or non-permanent adhesive may also be employed. Mitre seals 217 may be formed across the corners of the bag, preferably by heat sealing. The mitre seals 217 can create softer corners on the bag when the bag is filled with product, which is preferred for 30 palletisation of the bags. The corners of the bag beyond

the mitre seals 217 may be removed if desired.

Indicated in Figures 5 and 6 by dotted lines 216A, 216B the lines of weakness extend from the end edge 213 of the closure flap through the adhesive region 215.

- 5 Preferably, the lines of weakness 216A, 216B do not extend beyond the peelable region 215 towards the mouth and the fold 207 in order to preserve the integrity of the closure and to prevent product leakage.

When it is desired to empty the contents from the bag, 10 the bag is opened by gripping the closure flap 205 at the appropriate place and peeling back the closure flap 205 or the portion 219 thereof. Specifically, in Figures 5 and 6 when the end edge 213 of the closure flap 205 is gripped at portion 219 and pulled, the closure flap 205 15 tears along the lines of weakness 216A, 216B and portion 219 is separated from the remaining parts 220 of the closure flap 205. Especially where, as in Figure 6, the end edge 213 of the closure flap 205 is sealed to the first side wall 201 by means of seals 212A and 212B, the 20 unsealed portion 214 acts as a finger tab by means of which the closure flap 205 can be gripped. The portion 219 can then be separated by tearing along the lines of weakness 216A, 216B as far as the peelable region, so that the bag attains the open configuration as shown in 25 Figures 9 and 10 in which the mouth 221 is revealed.

As in the above embodiments, the peelable adhesive is selected so that its cohesive strength is less than its adhesive strength, so that (with reference to the embodiment of Figures 3 to 12) as the portion 219 continues to be pulled the portion 219 is separated from 30

the first side wall 201 in the peelable region 215 without substantial damage occurring to the portion 219 or the first side wall 201. That is, the first side wall 201 and the portion 219 are not torn (except along the 5 lines of weakness 216, 216A, 216B) or significantly distorted and the first side wall 201 remains functionally intact. When the lines of weakness have been torn along their full length, the portion 219 can be opened out (eg at fold 207) so that it can act as a dispensing spout for contents of the bag dispensed through mouth 221 formed between first side wall 201 and second side wall 202, as may best be seen from Figures 9 and 10. In Figures 9 and 10, various features such as mitre seals 217 and adhesive region(s) 215 have been 10 omitted for improved clarity.

As can be seen especially in Figures 9 and 10 the mouth 221 through which product may be dispensed from the bag 200 after opening of the closure flap 205 is defined by the end edge, or part of the end edge 209 of the first 20 side wall 201, in combination with the interior face of the second side wall 202.

Other constructions for the mouth 221 are possible. Thus, the mouth 221 may be formed as a slit in the first side wall 201 which slit is preferably (but need not 25 essentially be) close to the end edge 209. The closure flap 205 will then overlie the slit and be peeled back through a peelable region to reveal the slit. In this construction, the closure flap 205 does not necessarily have to depend from the second side wall 202 but may, for 30 example, include a portion beyond the slit (in the

direction of tearing the closure flap) which is permanently adhered to the first side wall. In this latter construction, alternative means are required to close the end of the bag beyond the slit. Such means may 5 include the closeable region described with respect to later embodiments of the invention.

In Figures 3 to 10, the portion of the closure flap 205 outside the peelable portion 219, may be attached to the first side wall 201 by non-peelable means such as, for 10 example, a non-peelable heat seal or a non-peelable adhesive.

The second flap 208 may also be used to provide means for re-closing the bag after opening. In particular, the second closure flap 208 may be provided with a layer of 15 adhesive (not illustrated) which may be used to adhere the second flap 208 to the inner face of the first side wall 202. Depending on the intended use of the bag, the adhesive applied to the second flap 208 may be peelable or permanent (non-peelable). A peelable adhesive may be 20 employed to provide an even more secure closure for the bag, before opening. More preferably the adhesive (peelable or non-peelable) applied to the second flap 208 may initially be covered by a protective tape such as of a plastics material or a coated paper. The protective 25 tape prevents the adhesive from adhering the second flap 208 to the second side wall 202. When it is desired to re-close the bag, the protective tape is simply peeled away to expose the adhesive, which may then stick to the second side wall 202. This latter construction is 30 particularly advantageous when the bags of the invention

are used for containing mail-order goods, as will be described more fully below.

Referring now to Figures 11 and 12, a still further variation of the invention is illustrated in which the  
5 bag 200 is provided with a third flap 280 at the end of the bag distant from the first fold 207. The third flap may depend from the first or second side walls 201, 202 and is attached to the respective second or first side walls 202, 201 by means such as adhesive region 300. The  
10 adhesive is preferably a peelable adhesive. The third flap 280 includes a fold 290.

In the use of this flap, goods may first of all be inserted into the bag via initially open end 218 which end 218 is then closed by means of the third flap 280.  
15 The goods are then transported or stored as required in the bag and, when required are accessed by peeling back closure flap 205 or peelable portion 219, as previously described to reveal mouth 221. If the goods need to be repacked in the bag, such as, for example, unwanted goods  
20 which are to be returned to the mail order supplier, they may be placed in the bag again through the mouth 221. The mouth 221 is then resealed by means of adhesive provided on second flap 208. Additionally or alternatively adhesive on the peelable portion 219, may  
25 be used to reseal the bag. In this case, the peelable adhesive may be resealable and/or an additional area of adhesive may be provided on the portion 219 or on first side wall 201, which is protected by means such as a protective tape which tape is removed before resealing.  
30 When access to the goods is again required, such as for

returned goods at the mail order company, the bag may be opened by peeling or tearing back third flap 280.

Referring now in particular to Figures 13 and 14, which show the base part of a bag according to one embodiment 5 of the invention. The mouth, closure flap and associated constructional details are omitted from these figures for reasons of clarity. In these figures the bag 901 is shown in a flat condition prior to filling. The bag 901 comprises a closure end 902 (which in the bag of the 10 invention will incorporate the easily openable closure), a base panel 903, first and second side walls 904a, 904b and side edges 905a, 905b. Side walls 904a, 904b are joined at marginal edges 905a, 905b along their entire length by suitable means such as heat welding and/or 15 adhesive and preferably by heat welding. However, in alternative constructions, the joins may be located elsewhere than the side edges, or, where the body of the bags is produced in the form of a tube, may be absent.

The base panel 903 comprises a tuck defined by first 20 folds 909' and 909" and second fold 990. The tuck has panel leaves or tuck leaves 906a and 906b each having two mitred edges 907. Mitred edges 907 are mitre seals comprising a seal line extending from each end of the second fold 990 (that is, at point X) to the first folds 25 909', 909" at points Y. The mitred edges 907 thus form internal corner boundary edges of the bag. The side walls 904a, 904b are joined to the base panel 903 along these seal lines which preferably comprise heat welds. As can best be seen in Figure 14, second fold 990 and 30 panel leaves 906a, 906b lie between the side walls 904a,

904b with the external faces of the panel leaves 906a, 906b towards each other.

- In the illustrated embodiment the first and second side walls 904a, 904b and the base panel 903 are unitary in that there is no intervening joint in a path passing from the illustrated limit of side wall 904a at the closure end to the fold 909', the fold 990 and the fold 909" and then to the illustrated limit of the side wall 904b at the closure end of the bag.
- 10 In less preferred constructions, side walls 904a and 904b may not for example be unitary in that the above defined path may be interrupted by a joint formed for example along fold line 990 or along or near to folds 909', 909".

When the bag is in its flat condition illustrated in Figures 13 and 14, the mitred edge 907 preferably forms an angle of between 30° and 60°, most preferably 45° with respect to the second fold 990.

Figure 15 illustrates a bag part similar to that of Figures 1 and 2, but in a substantially fully open condition containing, or ready to receive, a product. Side walls 904a, 904b no longer lie substantially flat against each other as in Figures 13 and 14, but are spaced apart from one another. In the embodiment illustrated the side edges 904a and 904b are joined to each other along side edges 905a and 905b. The joints preferably comprise heat welds along the whole length of side edges 905a, 905b although other joining means such as adhesive may additionally or alternatively be used.

Upper edges of side walls 904a, 904b will form the closure end of the bag and no constructional details are shown in this figure, for reasons of clarity. A substantially rectangular base portion 908 (which is part 5 of the base panel 903) on which the bag may rest in an upright position is defined by fold lines 909', 909" and 910', 910" and is formed by opening out panel leaves 906a, 906b of Figures 13 and 14. Mitred edges 907 now lie above a horizontal plane, preferably tending towards 10 a vertical plane, although filling of the bag may cause the mitred edges 907 to be displaced further from the vertical. Mitred edges 907 and fold lines 910', 910" define upstanding generally triangular end wall portions 911a, 911b. Fold lines 910', 910" form the base side of 15 portions 911a, 911b and mitred edges 907 form the remaining sides with the apex of the triangles at points X. Thus, in the embodiment illustrated the apex of the triangular end wall portions 911a, 911b lie above the base portion 908 in use. Portions 911a, 911b are formed 20 by an opening out of the panel leaves 906a, 906b and comprise end regions of the base panel 903. Preferably, the mitred edges 907 form an angle of between 30° and 60° with respect to the fold lines 910', 910". Additional reinforcements (such as reinforcement welds or adhered 25 reinforcement patches) may be provided where desired such as at points X where the welds of mitred edges 907 meet the welds of marginal edges 905a, 905b.

The mitred corner portion 912 formed by mitred edges 907 and illustrated in dotted lines in Figure 13 may be 30 removed if desired for improved palletisation, but this is not essential. If not removed, in the bag of Figure

15 the portions 912 simply form an extra triangular layer (not illustrated) overlying points Y-X-Y.

Thus, by means of this embodiment of the invention it is possible to provide a bag which can stand stably in an 5 upright position, which is suitable for carrying heavy and bulky materials, which is simple and cost effective to manufacture in an automated process and which provides excellent palletisation properties.

This variation of the invention provides a bag having an 10 easily openable closure portion and a stable, flat base portion. This type of bag is particularly suited for the transport of partially prepared food products within a factory and of prepared food products between factory and retail premises. An example of such a bag when complete 15 is illustrated in Figures 16, 17 and 18. Other suitable uses will be readily apparent to those skilled in the art. Features which are identical to or similar to those of Figures 13, 14 and 15 have not been specifically identified and will not be described again in detail.

20 Essentially, the bags of this embodiment of the invention combine the stable flat base with an easily openable closure which is the same as, or similar to, that described above and further provide an area by means of which the bag can be sealed after filling without 25 disturbing the easily openable closure.

Referring now to Figures 16 and 17a, the bag 500 incorporates a flat, stable base portion 508, the construction of which is preferably as described with reference to Figures 13, 14 and 15. The bag has a bag

portion 500A comprising a first side wall 501 and a second side wall 502. A closure flap is attached to the first side wall 501 to form a closure over the mouth 521. The second side wall 502 includes an extension 553 beyond

5 the bag portion 500A and so the mouth is defined by the end edge 509 of the first side wall 501, in combination with the interior face 502A of the second side wall 502. The closure flap 505 is attached to the first side wall 501 in any of the ways described above which allow it, or

10 a portion of it, to be peeled back to reveal the mouth 521 while allowing the first side wall 501 to remain functionally intact. Thus, the closure flap 505 may be attached to the first side wall 501 by means of a peelable adhesive, as in the first aspect of the

15 invention, or the peelable adhesive may be absent, as in the second aspect of the invention. Most preferably, the closure flap 505 is attached by means of peelable adhesive 515. The closure flap 505 is preferably tearable along lines of weakness 516, which lines 516 are

20 most preferably in the form of perforations. The bags of this embodiment may also include a flap 528 at the boundary of the mouth 521, which flap 528 is functionally equivalent to the flap 208 of the previously described embodiments.

25 In the illustrated embodiment of Figures 17a-c, the bag is closed by means of a closeable region 550. The actual closure may be effected by any suitable means 551, such as adhesive or heat sealing. In the embodiment of Figure 17a, the closeable region is formed from an end part 552

30 of the closure flap 505 and the extension 553 of the second side wall 502. The extension 553 extends beyond

the bag portion 500A and is most preferably formed integrally with the second side wall 502.

In use of the bag, the closeable region 550 is initially open to allow the bag to be filled. When the desired 5 contents have been placed in the bag, the closeable region 550 is closed by the appropriate means 551. When access is required to the contents of the bag, the closure flap 505, or the portion 519 thereof (in the embodiment illustrated), is peeled back to reveal the 10 mouth, so that the contents may be dispensed.

Other constructions of the closeable region are possible. For example, the first and second side walls 501, 502 may be of the same length so that there is no extension 553. In this case, the mouth 521 is formed as a slit or cut in 15 the first side wall 501 and the closure flap 505 overlies the slit or cut. Thus, the closeable region may be formed by end parts of the first side wall 501, the second side wall 502 and the closure flap 505. This construction is illustrated in Figure 17b. In another 20 variation illustrated in Figure 17c, the slit or cut forming mouth 521 may be spaced further from the ends of the side walls 501, 502 (that is, nearer to portion 508). In this case, the closure flap 505 may also be spaced further from the said ends 509, 510 of side walls 501, 25 502 and need not overlie the said ends. The closeable region 550 may then comprise only the end regions of the side walls 501, 502. In this variation, the closure flap 505 must be attached to the first side wall 501 on both sides of the slit, with a portion at least one side 30 being peelable or otherwise removable to reveal the slit,

while leaving the first side wall 501 functionally intact. In this variation as illustrated in Figure 17c, the closure flap 505 is peelably attached by means of peelable adhesive 515 and permanently attached by 5 suitable means at 554.

A further variation of the bag of this embodiment is illustrated in Figure 18. This bag differs from that of Figure 17 only by the provision of handles 560. These handles may be punched, cut or otherwise formed towards 10 the top of the bag, preferably just above the closeable region 550. As an alternative, separate handles may be attached to the bag in or near the closeable region.

Methods of production of the bags according to the invention will now be outlined, although it should be 15 noted that the bags of the invention are not confined to these methods.

Initially, a method of producing the bags of Figures 1 to 12 will be described in outline, with particular reference to Figure 19. A web 600 of plastics film is 20 extruded and is folded over at 601 to the configuration shown in Figure 19A. An optional second fold 602 is then made which will ultimately provide the optional second flap 208 (Figures 2, 7, 8) (Fig 19B). Next, one or more areas of peelable adhesive 603 (such as a hot melt adhesive) are applied to the surface of the bag (Fig 19C) 25 and the perforations 604 are formed (Fig 19D) which provide the lines of weakness 216 (Figs 3, 4, 5, 6). The portion 605 of the web 600 is then folded over and adhered by the peelable adhesive 603 (Fig 19E). The web 30 600 is cut near first fold 601 to provide the open end

606 of the bag, by means of which the bag may ultimately be filled (Figure 19F). The web is finally sectioned into bags of appropriate width and heat seals (or other seals) are formed at the sides to result in the final  
5 bag.

Two methods of production of the bags according to Figures 16, 17 and 18 will now be described. In the first method, illustrated in Figure 20, a web 700 is first folded at fold 701 (Fig 20A). A tuck 702 is then  
10 formed from the fold 701 (Fig 20B) and mitre seals 703 are formed at the corners of the tuck portions (Fig 20C). A portion 704 of web 700 (indicated by dotted line) is then removed (Fig 20D) and peelable adhesive 705 is applied to the surface of the web 700 (Fig 20E). An  
15 additional web 706 incorporating lines of weakness 716 is then applied to the peelable adhesive and to overlie the area 707 of the web (Fig 20F). Finally the web is sectioned and the resulting side edges are closed (such as by heat sealing) to form the final bags. The parts  
20 706 and 707 provide the closeable region 708 (Fig 20G).

In an alternative, less preferred, method illustrated in Figure 21, the steps illustrated in Figs 21A to 21E are the same or similar to those of Figs 20A to 20E. In the step illustrated in Figure 21F, perforations 709 (which  
25 form the lines of weakness 216) are formed in the part 707, which part 707 is then folded over at fold 710 (Fig 21G) and adhered to the peelable adhesive 705. The web 700 is then cut in the region of fold 710 to provide the opening of the bag (Fig 21H). The fold 710 is so spaced  
30 from the end of the web 700 at 711 as to allow for a

closeable region 712 after the fold 710 has been cut off. The web is then sectioned and the side edges sealed as previously described in relation to Figure 20G.

In Figure 22, a method of making a bag similar to the bag 5 of Figures 1 to 12 is illustrated. For this bag, the mouth is spaced from the ends of the bag, although the method can be adapted to position the mouth nearer to the ends of the bag.

Referring now to Figure 22, a web 750 of plastics film is 10 extruded and is folded over at folds 751 and 752 to the configuration shown in Figure 22A. In Figure 22A, the spacing of the end edges 753, 754 of the web 750 is exaggerated for reasons of clarity. An optional third fold forming an optional second flap depending from edge 15 753 or 754 may also be included. This second flap is similar in construction and operation to the second flap depending from fold 602 is Figure 19.

Next, one or more areas of peelable adhesive 755 (such as a hot melt adhesive) are applied to the surface of the 20 bag. Adhesive 756 is also applied at the opposite side of gap 757, which adhesive 757 may be peelable or permanent (Figure 22B). An additional web 758 is then applied to the adhesive regions 755, 756 to overlie (and close) the gap 757. The additional web includes lines of 25 weakness 759 (Figure 22C). Finally, the web 750 is sectioned to form individual bags and one side 760 is sealed, such as by heat sealing or adhesive (Figure 22D). The other end 761 is open for filling the bag and may be closed in region 762 after filling of the bag (Figure 30 22E). In an alternative variation, after the step

illustrated in Figure 22C, the web 750 may be sectioned as in Figure 22D to form individual bags, and both the side edges 761 and 763 may then be sealed, such as by adhesive or heat sealing. In this variation, in order to 5 provide access to the bag for filling, the fold 752 may be cut off (either before or after the web 750 is sectioned). This end portion may then be closed after filling of the bag, such as by heat sealing or adhesive.

Figure 23 illustrates another variation of the bags of 10 the invention in which the mouth is spaced from the ends of the bag. Referring to Figure 23, the bag 560 includes a flat, stable base portion 508, the construction of which is preferably as described with reference to Figures 13 to 15, and with reference to Figures 16 and 15 17. The bag 560 also includes a closeable region 550 which may be closed in any of the ways previously described, after filling of the bag. The mouth 521 of the bag 560 is in the form of a slit or gap 562. The mouth 521 is closed by means of a closure flap 565 which 20 overlies the gap 562. The closure flap is attached to the front face 561 of the bag by means of a region of peelable adhesive 563 and, at the other side of the gap 562, by means of a region of peelable or permanent adhesive 564. The closure flap includes lines of 25 weakness 566 along which the closure flap 565 may be torn so that a portion 569 may be peeled back through the region of peelable adhesive 563 to expose the mouth 521.

Figure 24 illustrates one method of making the bag of 30 Figure 23. In this method, a web 770 of plastics film is extruded and is folded over at fold 771 and 772 to the

configuration shown in Figure 24A. In Figure 24A, the spacing of the end edges 773, 774 of the web 770 is exaggerated for reasons of clarity. An optional third fold forming an optional second flap depending from edge 5 753 or 754 may also be included. This second flap is similar in construction and operation to the second flap depending from fold 602 in Figure 19.

Next, a tuck 775 is formed from fold 771 (Figure 24B) and mitre seals 776 are formed at the corners of the tuck 10 portions (Figure 24C). Subsequently, fold 772 is cut away to provide an end 776 of the resulting bag open for filling (Figure 24D). A region or regions of peelable adhesive 777 is applied to the bag adjacent gap 778 and adhesive regions 779 are also applied on the opposite 15 side of gap 778. Adhesive regions 779 may be peelable or non-peelable. The locations of the adhesive regions 777 and 779 may be reversed if desired (Figure 24E). An additional web 780, including lines of weakness 781, is then applied to the adhesive regions 777, 779 to overlie 20 (and close) the gap 778 (Figure 24F). Finally, the web 770 is sectioned to form individual bags and the side edges are sealed, such as by heat sealing or adhesive. After filling of the bag, the open end 776 may be closed by suitable means in closeable region 782.

CLAIMS

1. A plastic bag comprising:

5 first and second side walls which together form a bag portion having front and rear faces;

a mouth formed at the front face of the bag for access to the interior of the bag; and

10 a closure flap overlying and closing the mouth and having a region which is peelably attached to the front face;

wherein at least a portion of the closure flap may be peeled away from the front face across the peelably attached region to reveal the mouth, such that the front face remains functionally intact.

15 2. A plastic bag as claimed in claim 1 in which the portion of the closure flap which may be peeled away from the front face is defined by at least one line of weakness extending through the peelably attached region and along which the closure flap is torn to expose the mouth of the bag.

20 3. A plastic bag comprising:

first and second side walls which together form a bag portion having front and rear faces;

25 a mouth formed at the front face of the bag for access to the interior of the bag;

and a closure flap overlying and closing the mouth and having a region which is attached to the front face;

5           wherein the closure flap includes at least one line of weakness defining a portion of the flap which does not include any part of the region which is attached to the front face and which portion can be opened by tearing along the line of weakness to expose the mouth of the bag.

10     4. A plastic bag is claimed in claims 1, 2 or 3 wherein the closure flap includes a line of weakness in the form of an arc extending from points on the closure flap proximate the mouth towards an end edge of the closure flap.

15     5. A plastic bag as claimed in any of claims 2 to 4 including at least one finger hole formed in the closure flap on the line of weakness by means of which the closure flap may be gripped for tearing.

20     6. A plastic bag as claimed in claims 1, 2 or 3 wherein said portion is defined by at least two lines of weakness in the closure flap along which the closure flap is torn to expose the mouth of the bag.

25     7. A plastic bag as claimed in claim 6 wherein the lines of weakness terminate in one or more finger holes formed in the closure flap, by means of which the closure flap may be gripped for tearing.

8. A plastic bag as claimed in claim 6 wherein the lines of weakness extend from an end edge of the closure flap to points proximate the mouth.
9. A plastic bag as claimed in any of claims 1, 2 or 4 to 8 when dependent on claim 1 or 2 wherein the portion of the closure flap which may be peeled away is attached to the front face by means of a peelable adhesive.  
5
10. A plastic bag as claimed in any of claims 1, 2 or 4 to 8 when dependent on claim 1 or 2 wherein the portion of the closure flap which may be peeled away is attached to the front face by means of a peelable heat weld or peelable heat sealed region.  
10
11. A plastic bag according to any of claims 2 to 10 wherein the lines of weakness are perforations formed in the closure flap.  
15
12. A plastic bag as claimed in any preceding claim comprising a closeable region formed at a first end of the bag for closing the bag after filling.
- 20 13. A plastic bag as claimed in any preceding claim in which the first side wall forms the front of the bag; the second side wall forms the rear of the bag; the said side walls being of substantially the same length.
- 25 14. A plastic bag as claimed in claim 13 wherein the mouth comprises a slit formed in the front face.
15. A plastic bag as claimed in claim 13 comprising a further line of weakness, formed in the front face,

which line of weakness may be ruptured to form the mouth.

16. A plastic bag as claimed in any of claims 13 to 15 wherein the closeable region includes end parts of  
5 the first and second side walls.
17. A plastic bag as claimed in claim 16 wherein the closeable region further includes an end part of the closure flap.
18. A plastic bag as claimed in any of claims 1 to 12 in  
10 which the first side wall forms the front of the bag, the second side wall forms the rear of the bag and in which the second side wall has an extension beyond the bag portion.
19. A plastic bag as claimed in claim 18 wherein the  
15 closure flap overlies a part of the first side wall and said extension of the second side wall.
20. A plastic bag as claimed in claim 19 wherein the mouth is defined by the end edge of the first side wall.
- 20 21. A plastic bag as claimed in claim 19 or 20 wherein  
the closeable region includes the extension of the second side wall and an end part of the closure flap.
22. A plastic bag as claimed in any of claims 1 to 21  
25 further comprising a second flap depending by means of a boundary fold from an edge of the mouth and extending into the interior of the bag.

23. A plastic bag according to claim 22 wherein the second flap is attachable by means of an adhesive to the inside face of the second side wall.
24. A plastic bag according to claim 23 wherein said adhesive is a peelable adhesive.  
5
25. A plastic bag as claimed in any of claims 1, 2 or 4 to 24 wherein on the portion of the closure flap which may be peeled away any path extending from the boundary of the said portion nearest to the mouth to  
10 the boundary of the said portion distant from said mouth must pass through a peelably attached region.
26. A plastic bag as claimed in any of claims 4 to 25 wherein a path along the first side wall substantially parallel to and adjacent to the mouth lies entirely in a peelably attached region, at  
15 least within the peelable portion of the closure flap.
27. A bag as claimed in any of claims 12 to 26 further comprising a base portion formed at an end of the bag distant from the closeable region and operative  
20 to provide a substantially flat region on which the bag may stand stably.
28. A bag as claimed in claim 27 wherein the base portion comprises:  
25 a base panel connected along opposing sides thereof to the respective first and second side walls by means of first folds, said panel further having a second fold, co-extensive with the width of said

- side walls and substantially parallel to said first folds, said second fold dividing the base panel into first and second panel leaves, such that the second fold and the panel leaves lie between said side walls with the external faces of the panel leaves towards each other; and
- mitre seals comprising a seal line extending from each end of said second fold to each first fold, along which seal lines the first and second side walls are respectively joined to the base panel.
29. A bag as claimed in claim 27 wherein the base portion comprises a generally rectangular base panel having opposed side edges and opposed end edges and generally triangular end wall portions each depending along a base side thereof from a respective end edge of the base panel, said base panel being connected to the respective first and second side walls by means of first folds coincident with said respective side edges, said triangular end wall portions having an apex positioned in use above said base panel, and having side edges comprising seal lines extending between said apex and respective corners of said base portion along which the first and second side walls are respectively joined to the said end wall portions.
30. A plastic bag as claimed in claim 28 wherein the seal line of the mitre seals comprises a heat weld.

31. A plastic bag as claimed in claim 28 or 30 wherein the seal line of the mitre seals forms an angle of between 30° and 60° with respect to the second fold.
32. A plastic bag as claimed in claim 31 wherein the seal line of the mitre seals forms an angle of 45° with respect to the second fold.  
5
33. A bag as claimed in claim 13 wherein the mouth is defined by the end edge of the first side wall.
34. A plastic bag as claimed in any of claims 1 to 15 or 10 33 wherein the closure flap depends from the second side wall.
35. A plastic bag as claimed in claim 34 wherein the closure flap is formed integrally with the second side wall and depends from the second side wall  
15 along a fold.
36. A plastic bag as claimed in any of claims 1 to 26 wherein the bag is further provided with a third flap overlying and peelably attached to the first or second side wall, which third flap depends from the second or first side wall at the end of the bag distant from the closure flap.  
20

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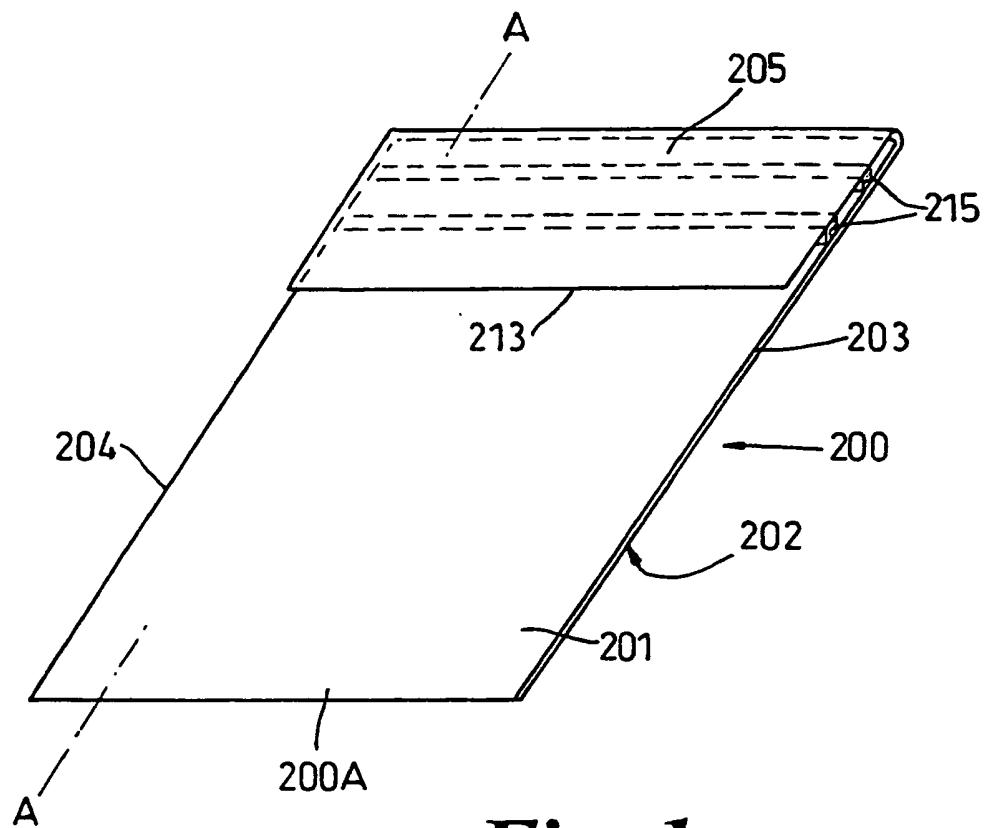


Fig. 1

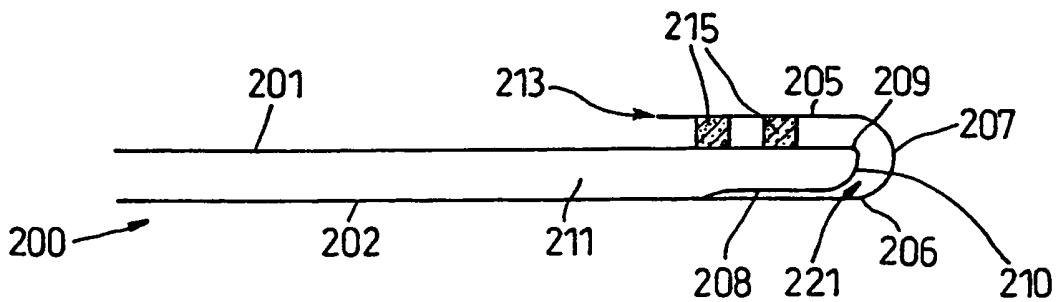


Fig. 2

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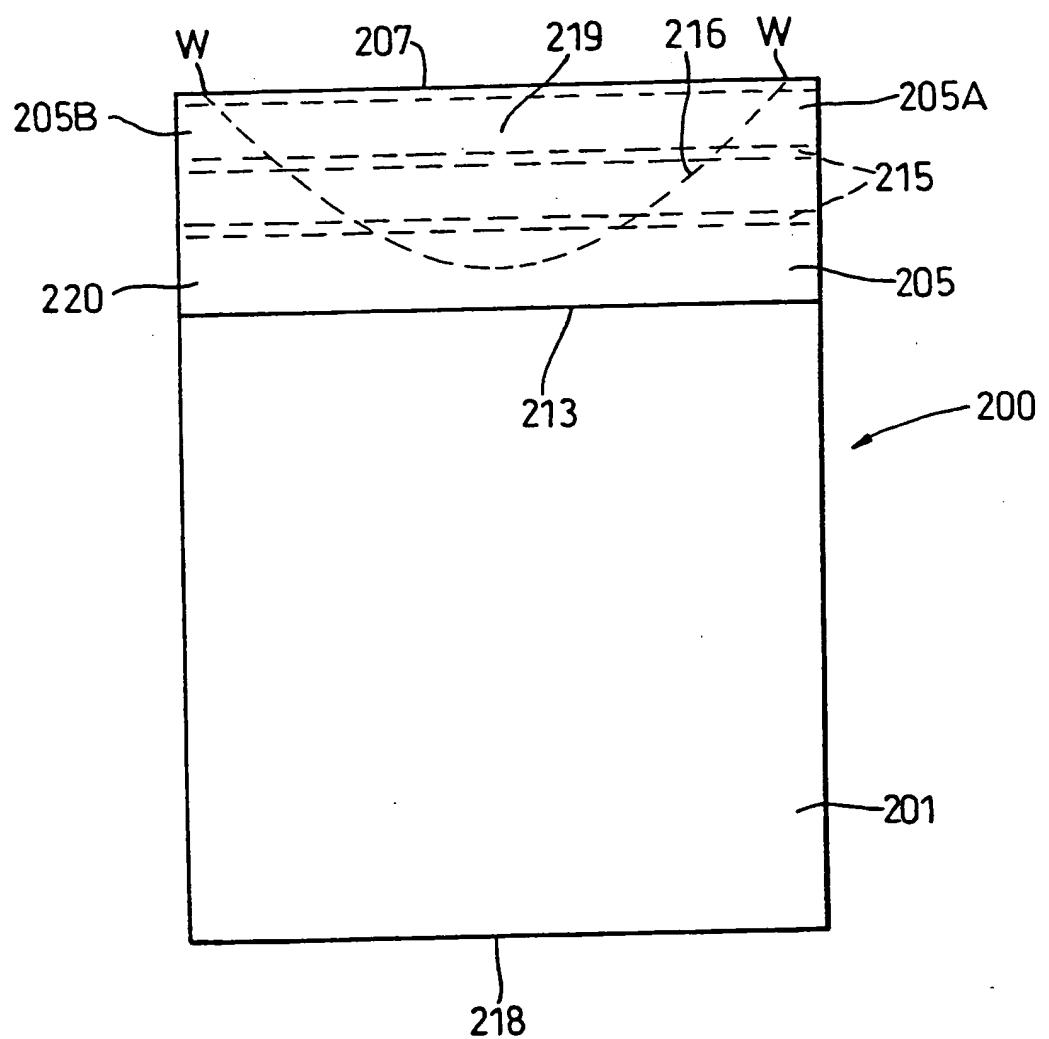
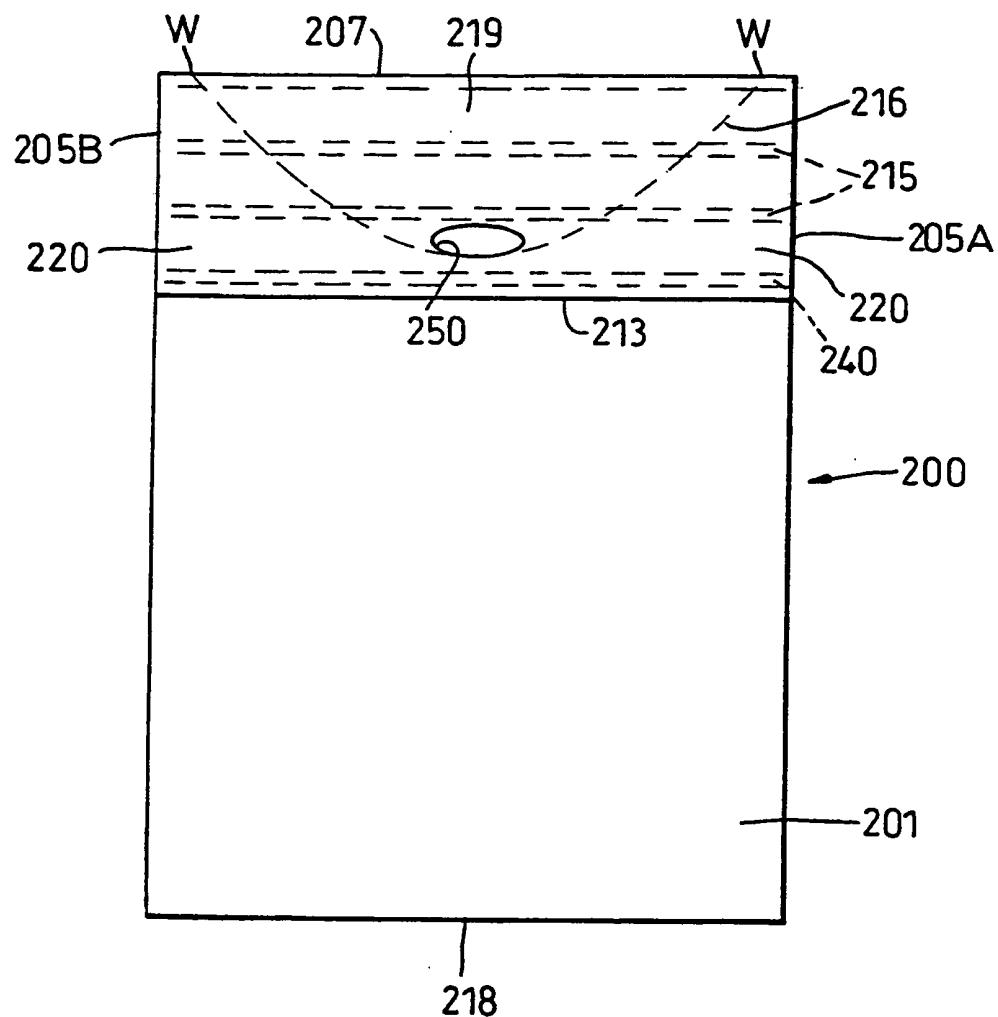


Fig. 3

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*Fig. 4*

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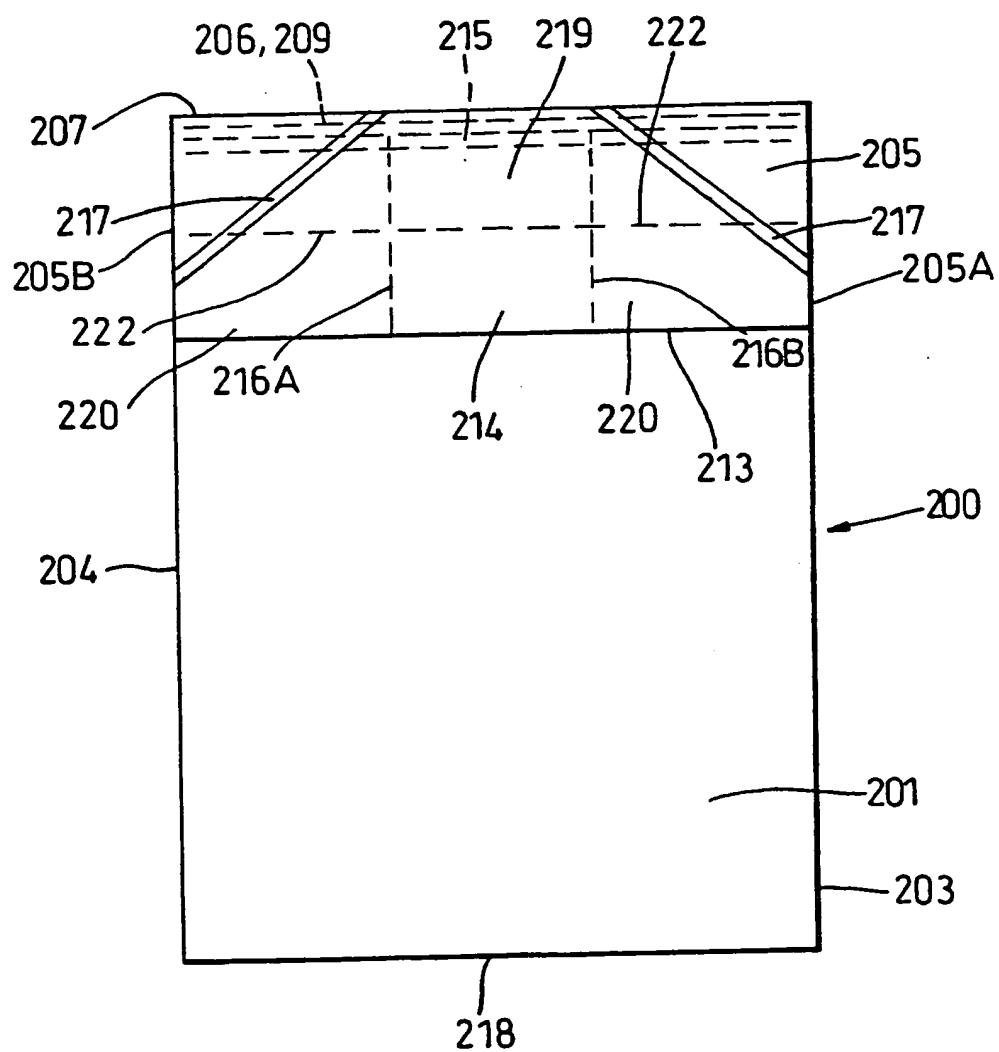
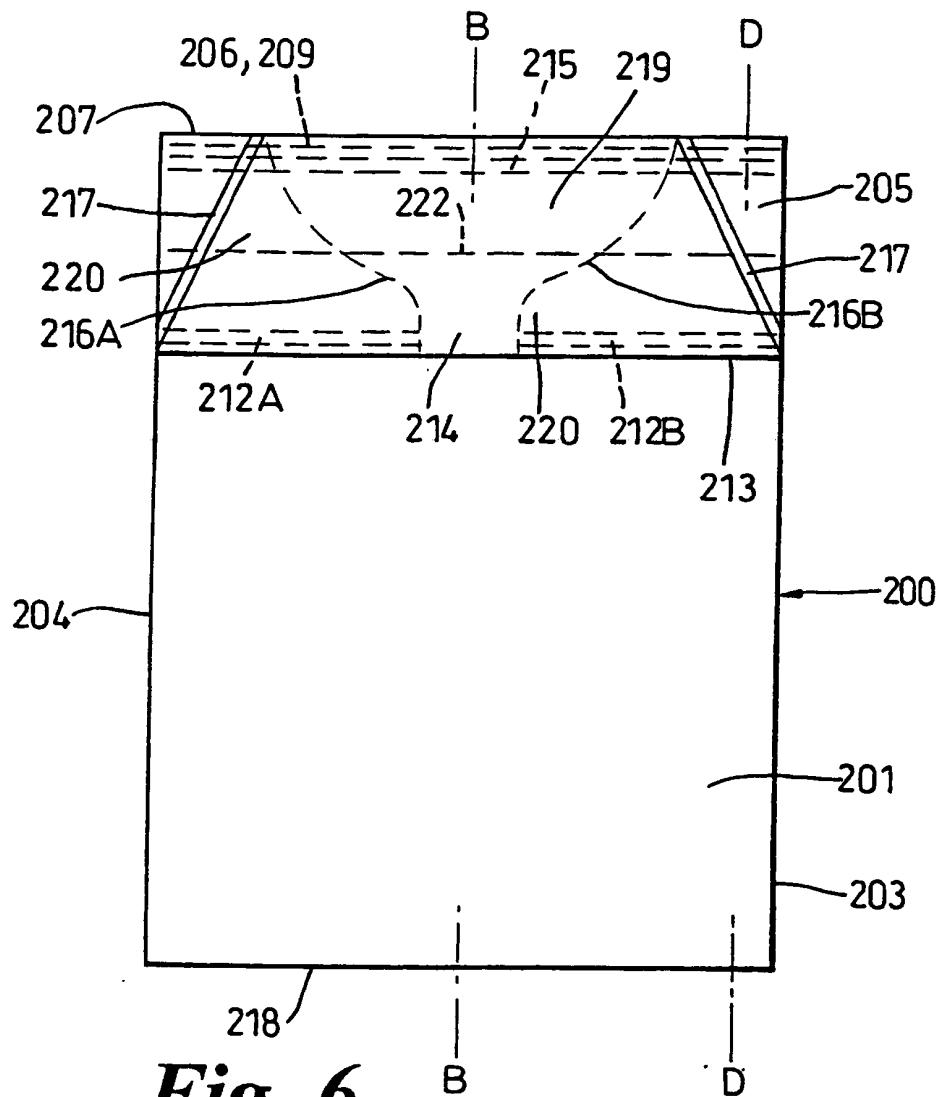
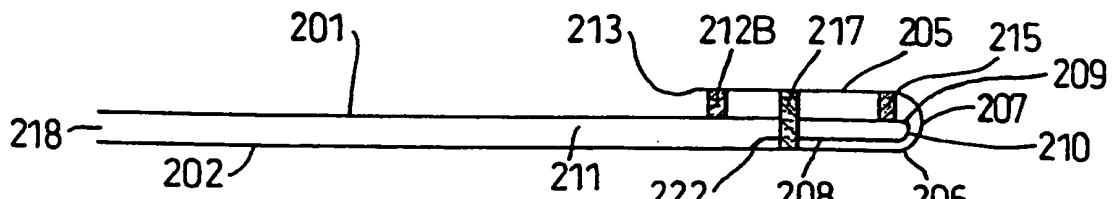
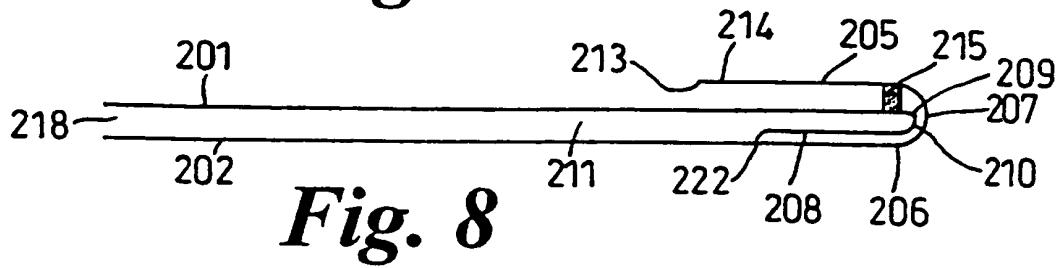


Fig. 5

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**Fig. 6****Fig. 7****Fig. 8**

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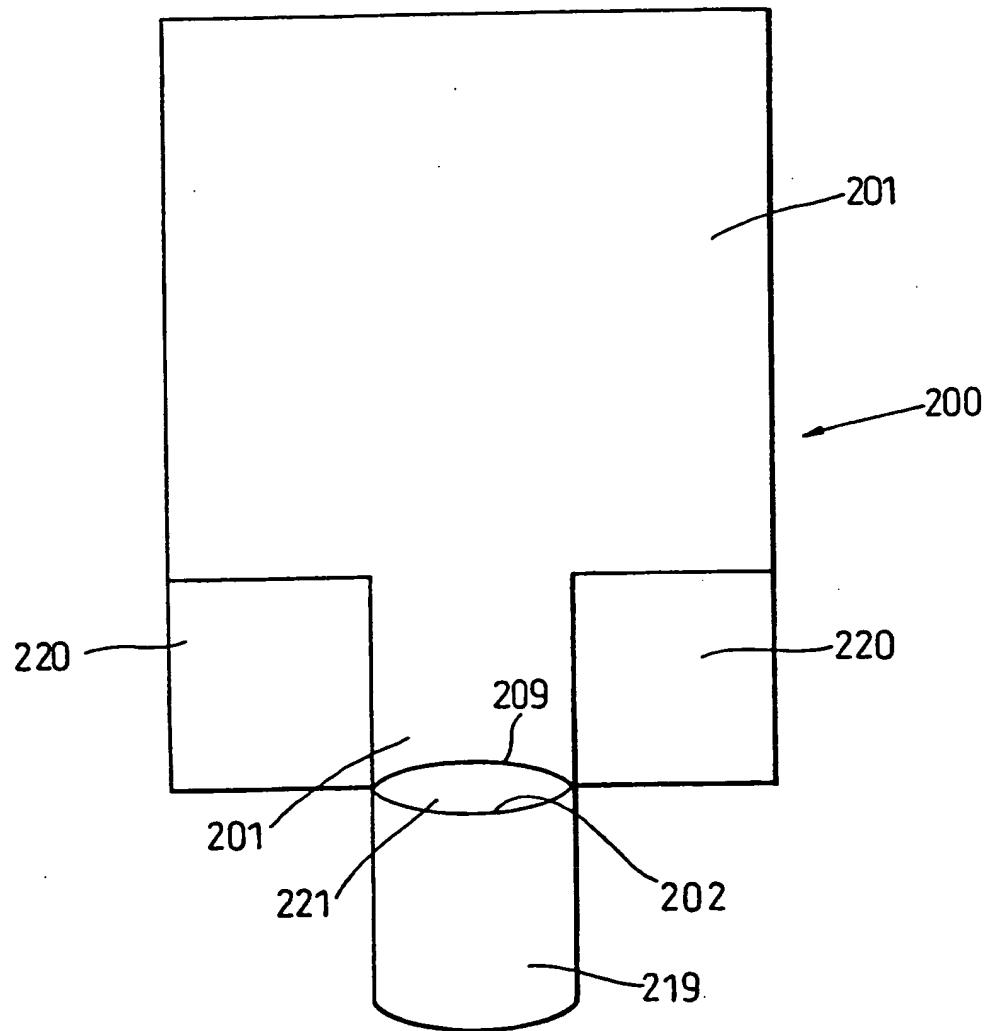
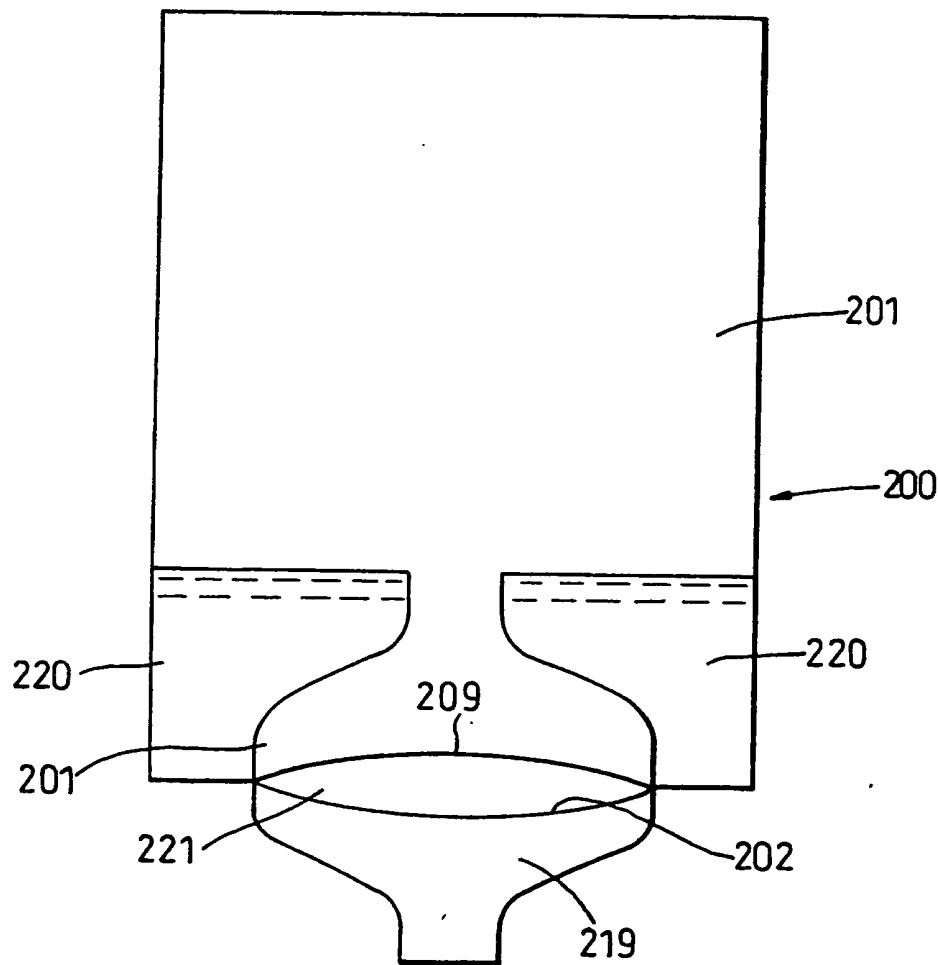


Fig. 9

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*Fig. 10*

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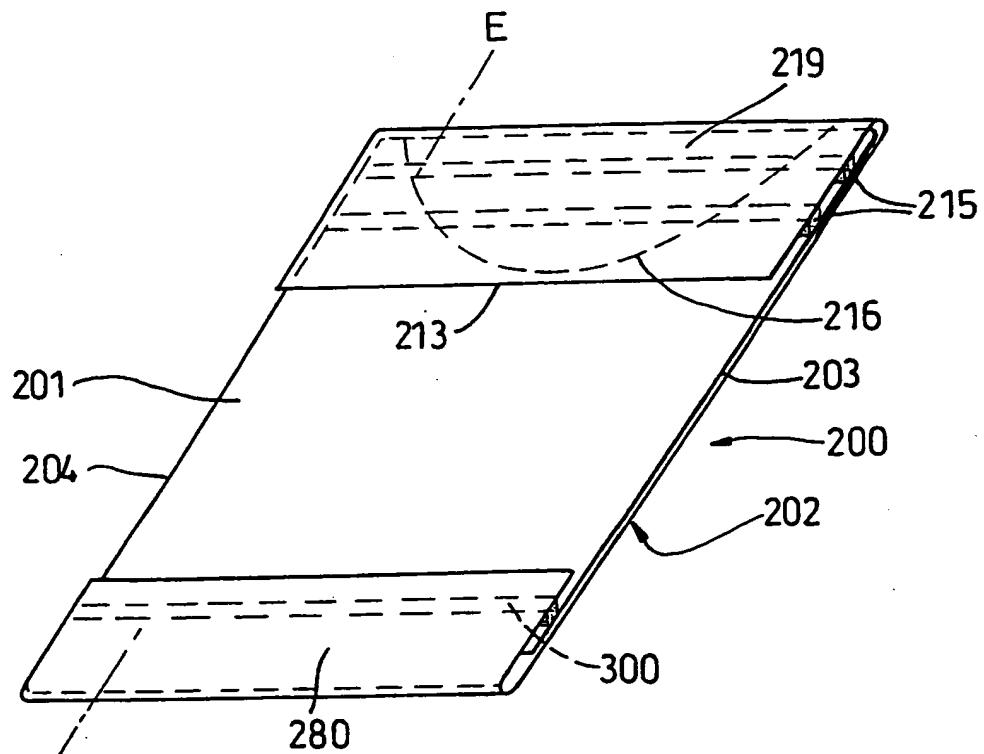


Fig. 11

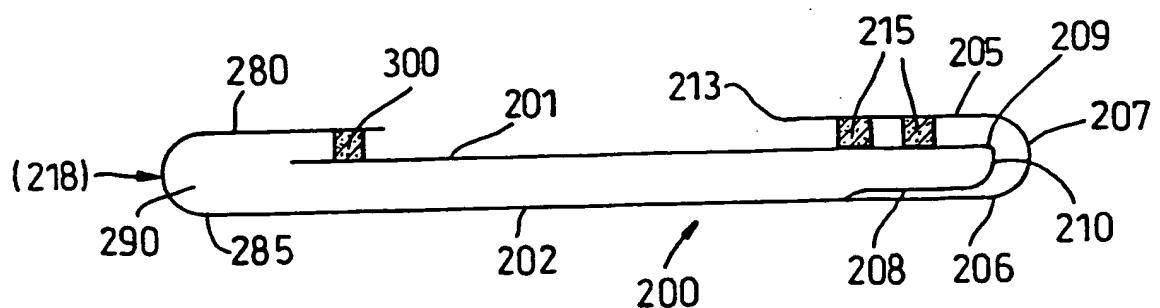
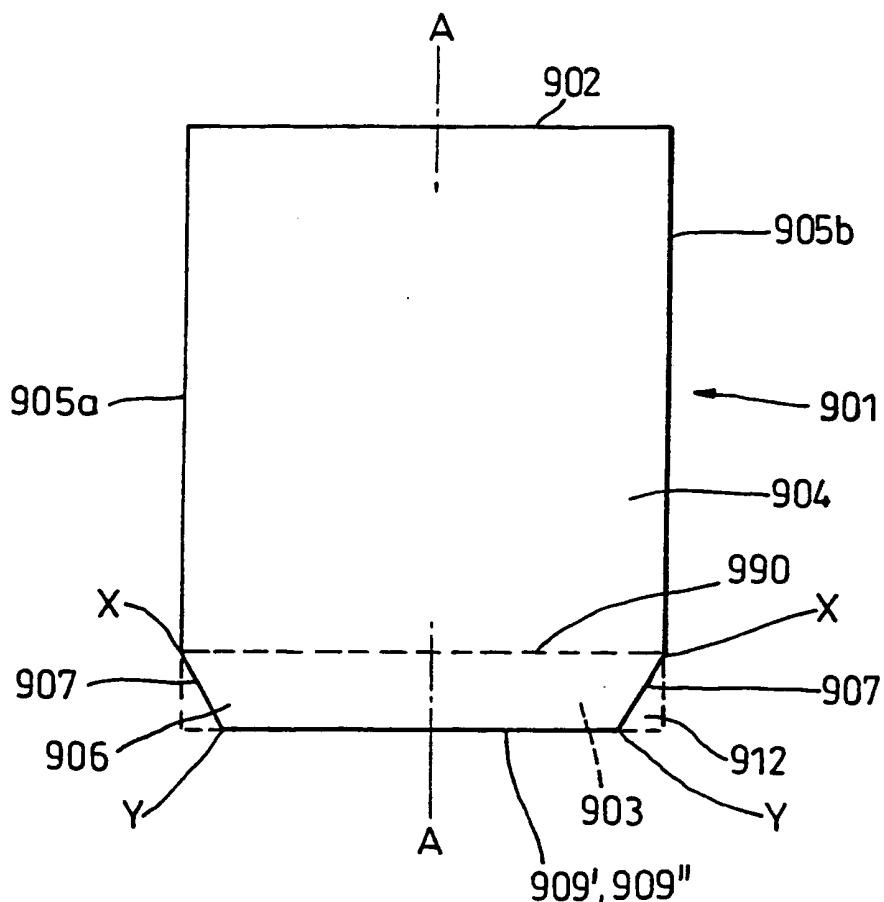
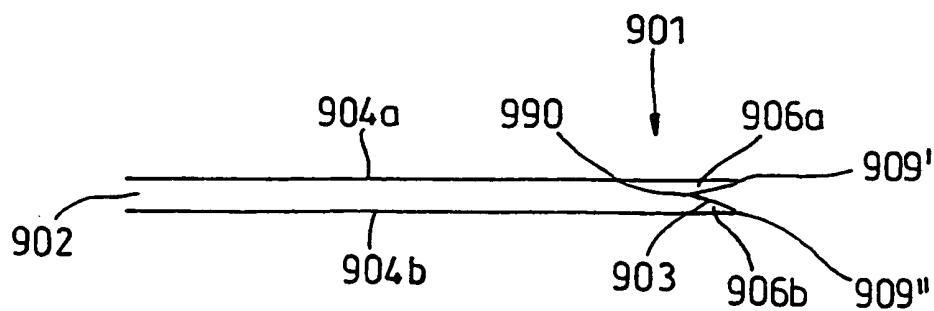


Fig. 12

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*Fig. 13**Fig. 14*

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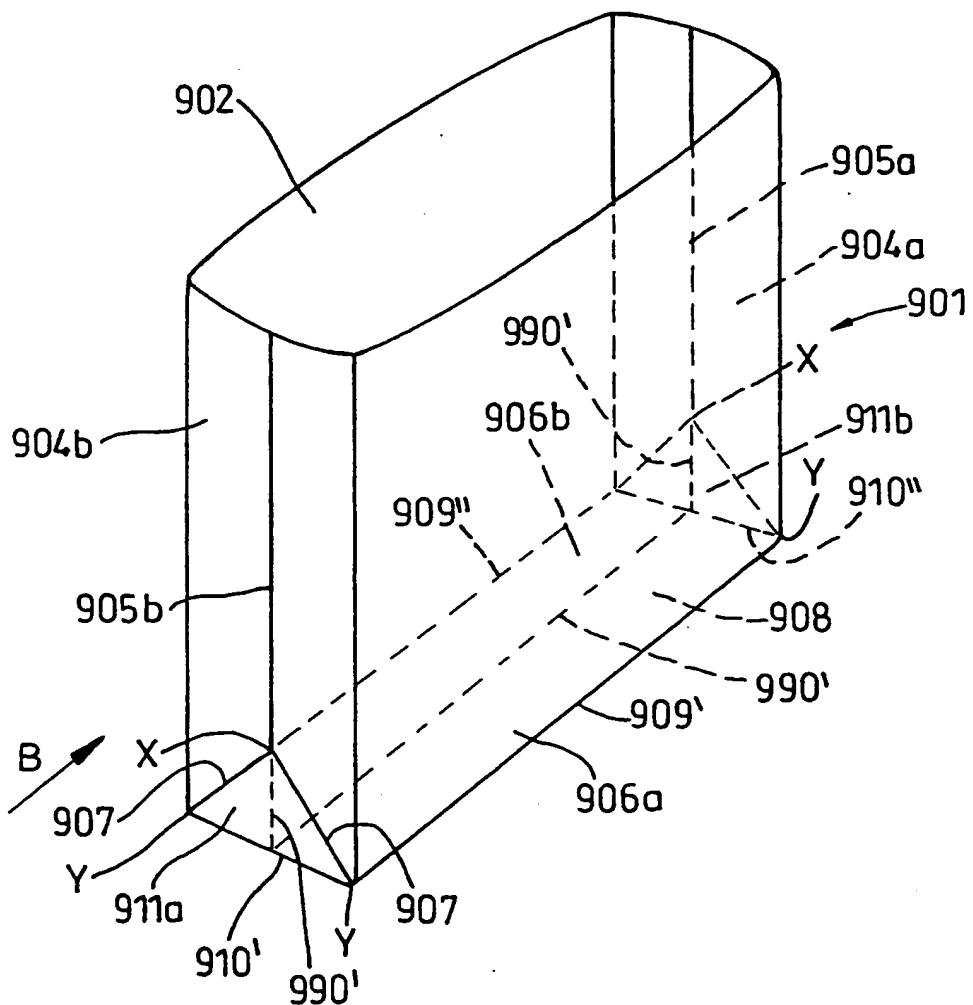
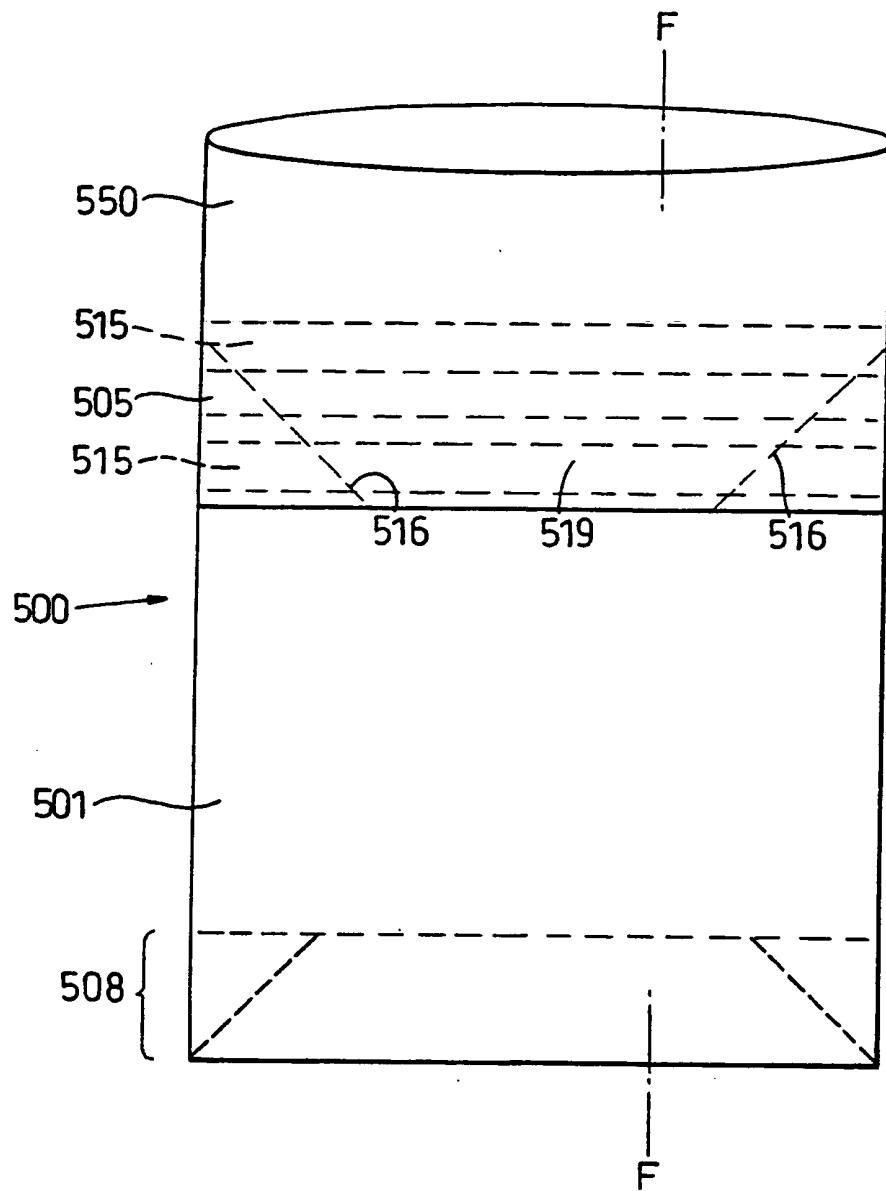


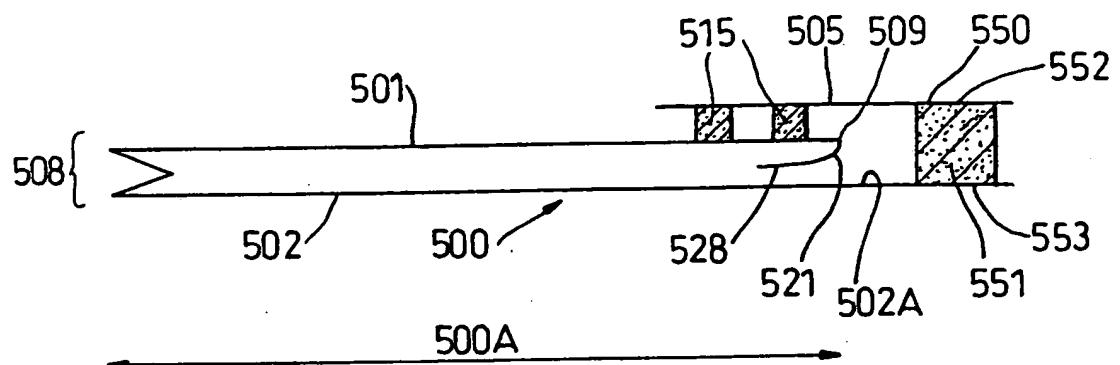
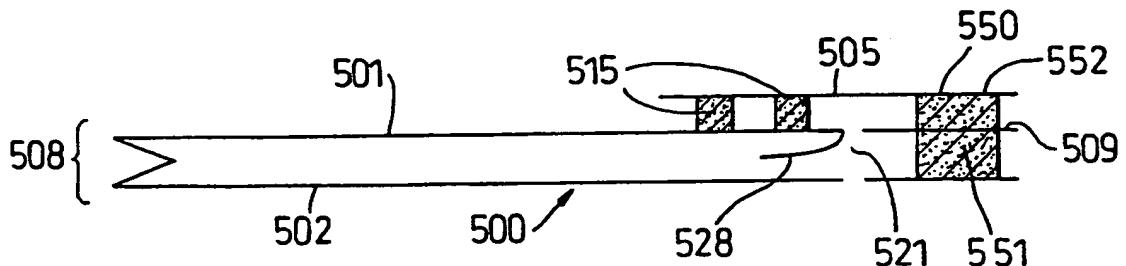
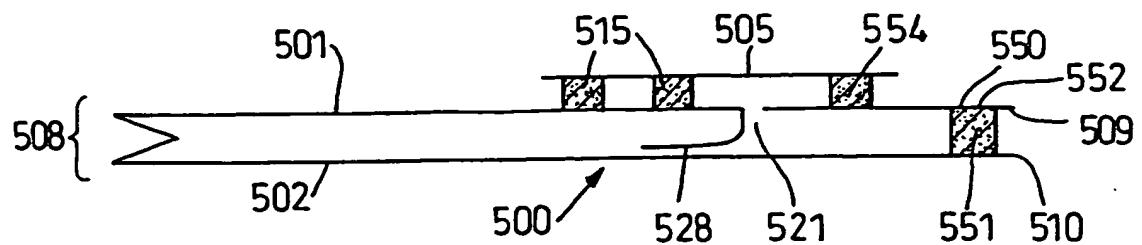
Fig. 15

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*Fig. 16*

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*Fig. 17A**Fig. 17B**Fig. 17C*

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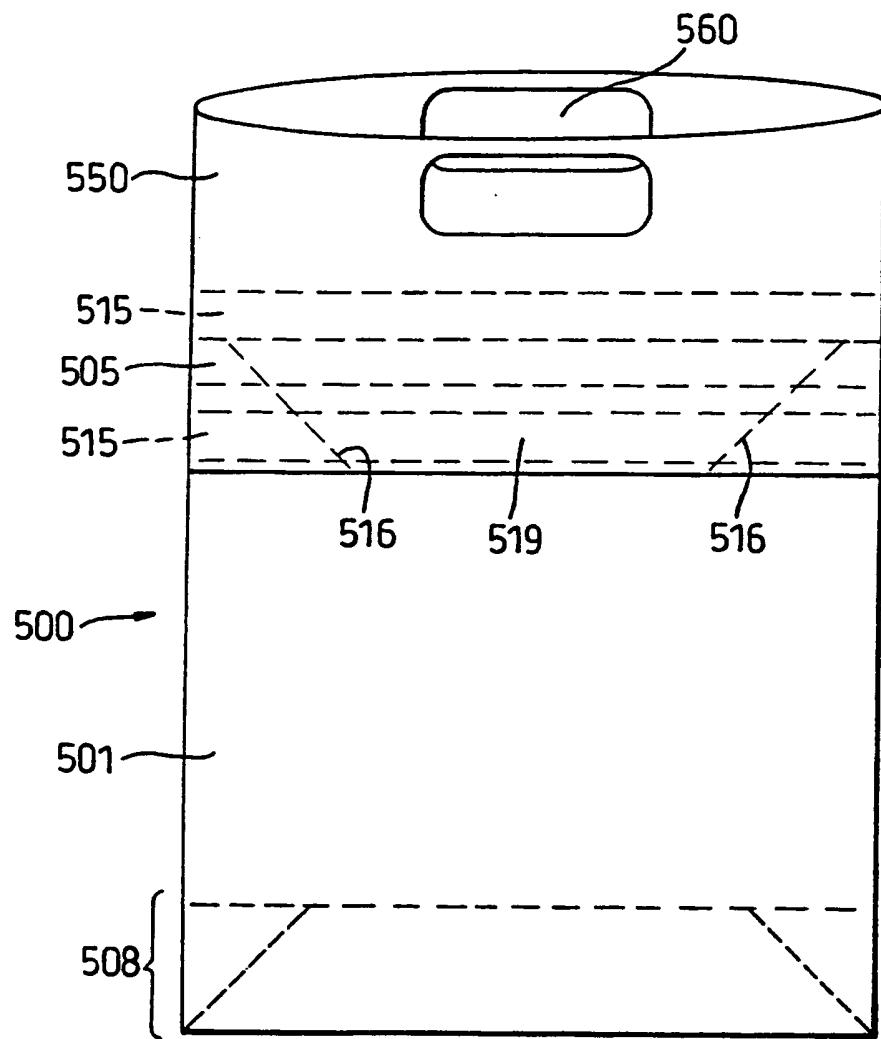
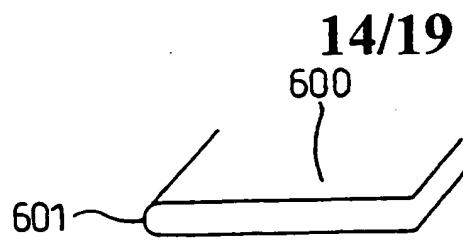
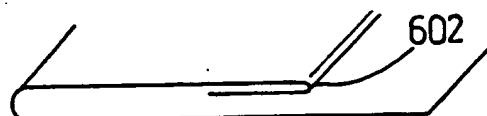


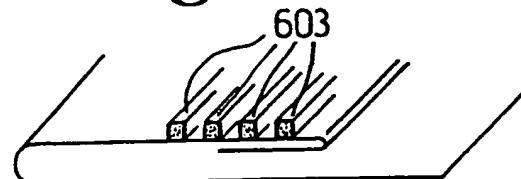
Fig. 18



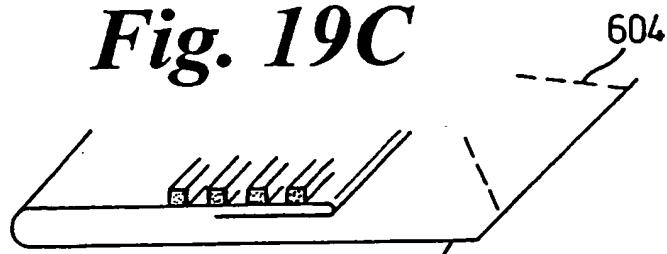
*Fig. 19A*



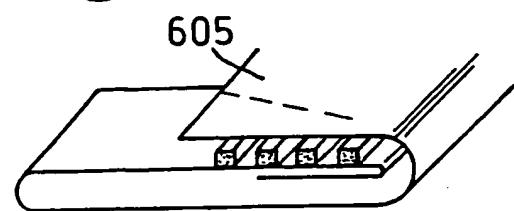
*Fig. 19B*



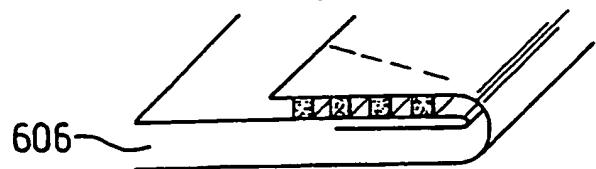
*Fig. 19C*



*Fig. 19D*

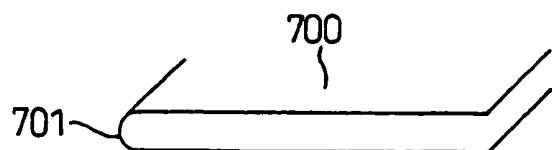


*Fig. 19E*

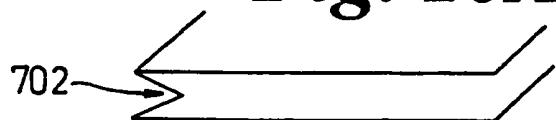


*Fig. 19F*

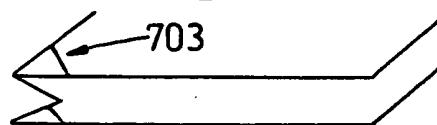
15/19



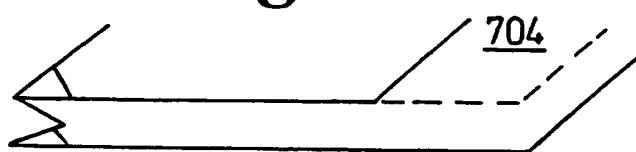
*Fig. 20A*



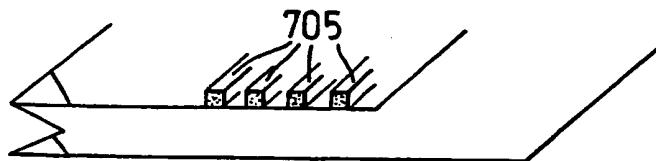
*Fig. 20B*



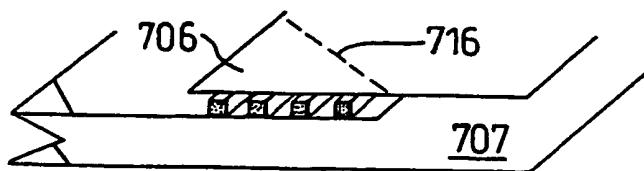
*Fig. 20C*



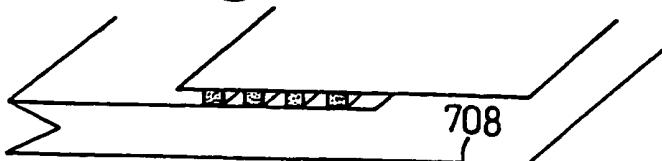
*Fig. 20D*



*Fig. 20E*

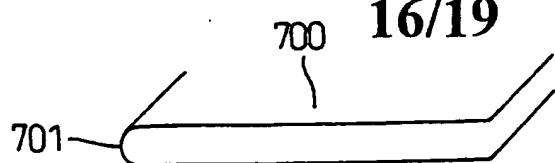


*Fig. 20F*

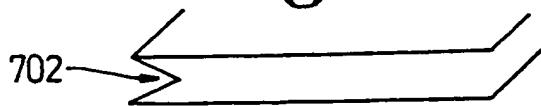


*Fig. 20G*

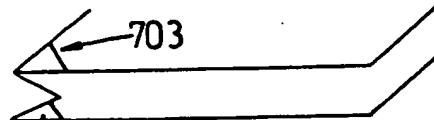
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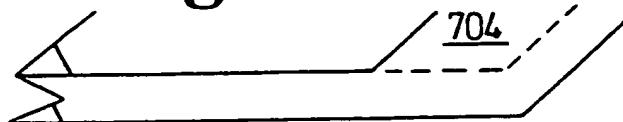
**Fig. 21A**



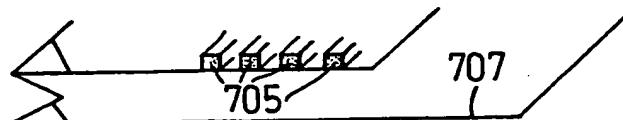
**Fig. 21B**



**Fig. 21C**



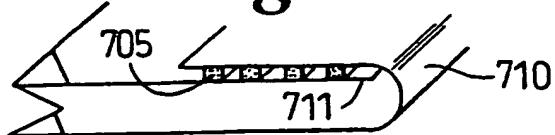
**Fig. 21D**



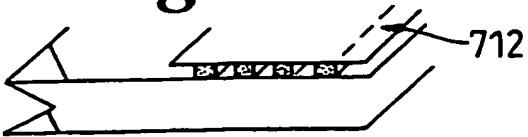
**Fig. 21E**



**Fig. 21F**

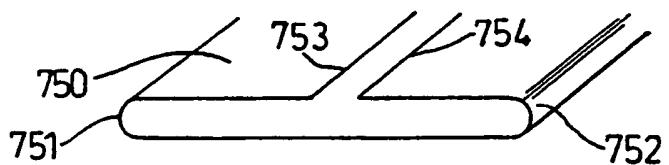


**Fig. 21G**

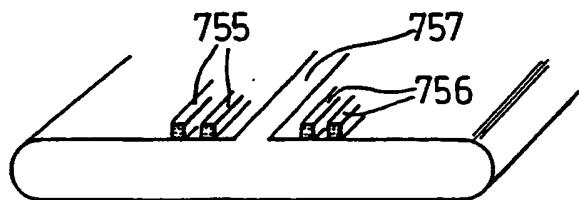


**Fig. 21H**

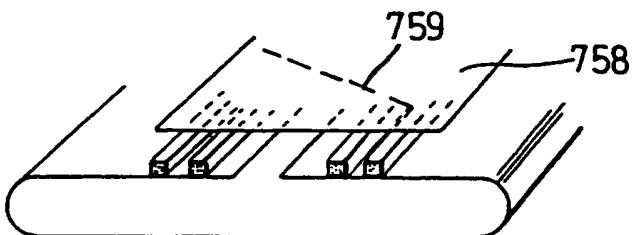
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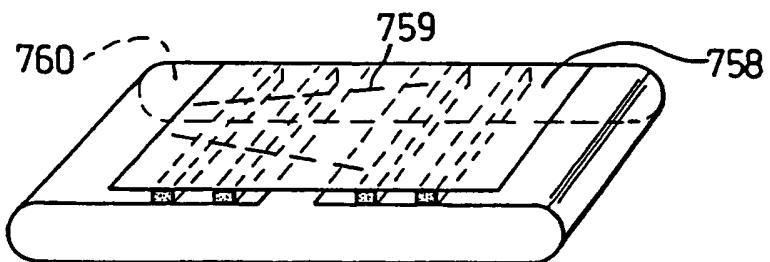
*Fig. 22A*



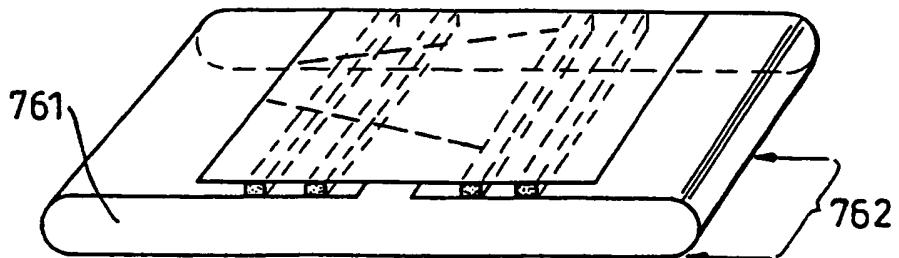
*Fig. 22B*



*Fig. 22C*



*Fig. 22D*



*Fig. 22E*

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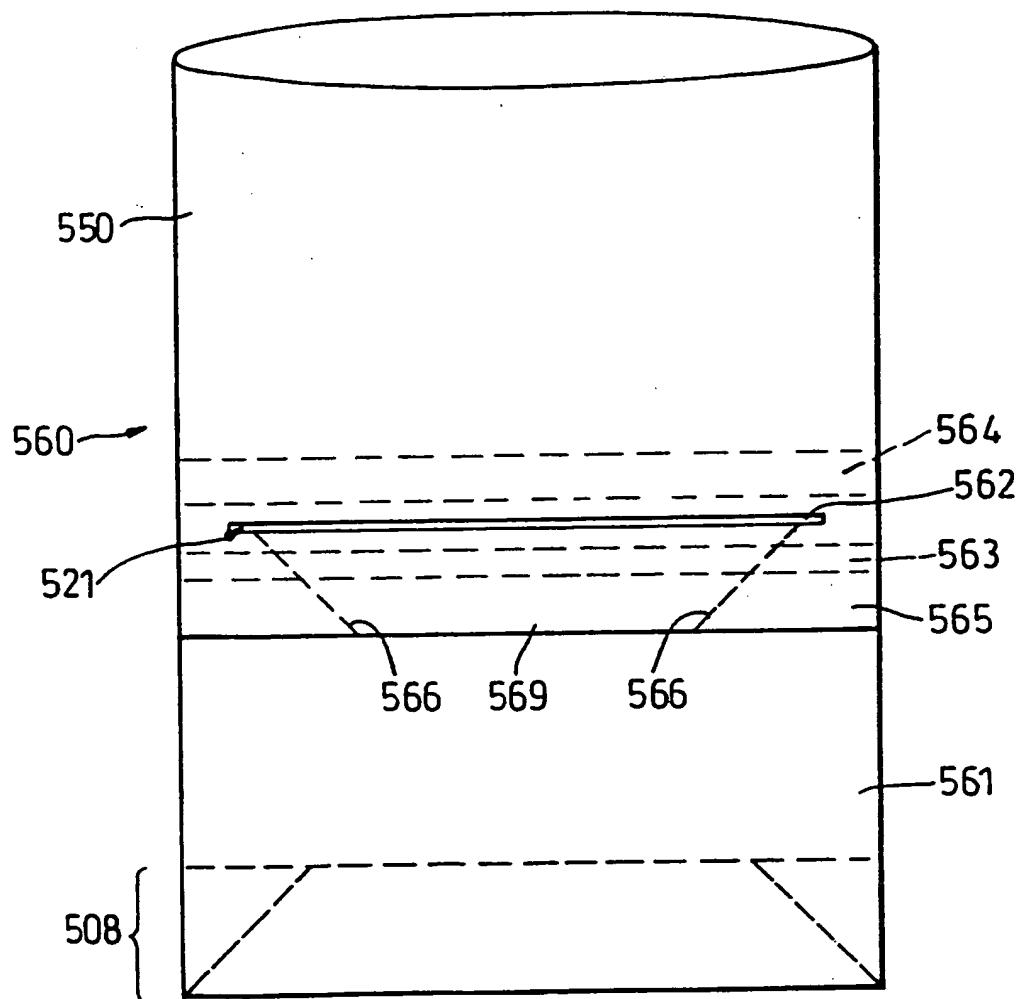
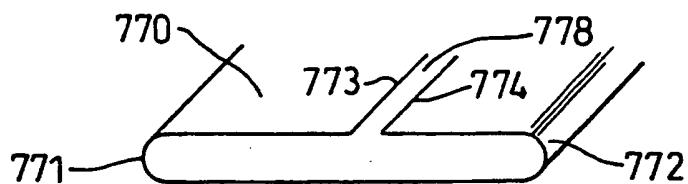
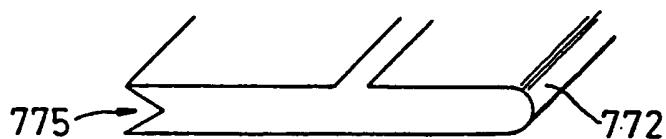


Fig. 23

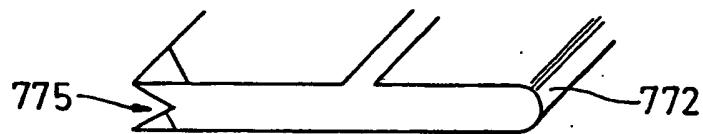
19/19



**Fig. 24A**



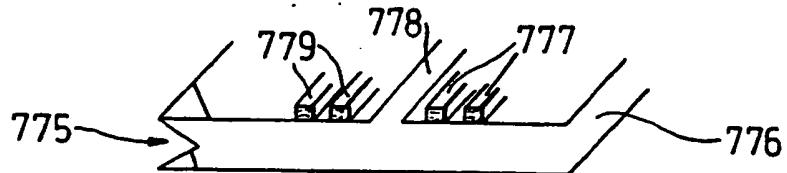
**Fig. 24B**



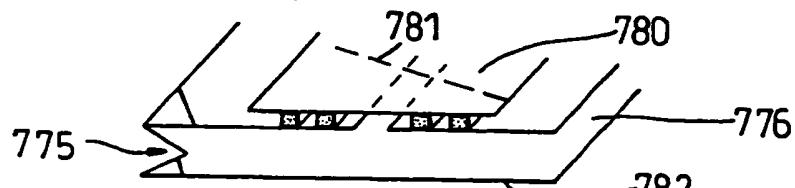
**Fig. 24C**



**Fig. 24D**



**Fig. 24E**



**Fig. 24F**



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>7</sup> :  B65D 33/18		A3	(11) International Publication Number: WO 00/02782  (43) International Publication Date: 20 January 2000 (20.01.00)									
<p>(21) International Application Number: PCT/GB99/02049</p> <p>(22) International Filing Date: 8 July 1999 (08.07.99)</p> <p>(30) Priority Data:</p> <table> <tr> <td>9814778.8</td> <td>8 July 1998 (08.07.98)</td> <td>GB</td> </tr> <tr> <td>9814771.3</td> <td>8 July 1998 (08.07.98)</td> <td>GB</td> </tr> <tr> <td>9912972.8</td> <td>4 June 1999 (04.06.99)</td> <td>GB</td> </tr> </table> <p>(71) Applicant (for all designated States except US): FLEXIPOL PACKAGING LIMITED [GB/GB]; Unit 14, Bentwood Road, Carrs Industrial Estate, Haslingden, Rossendale, Lancashire BB4 5HH (GB).</p> <p>(72) Inventors; and</p> <p>(75) Inventors/Applicants (for US only): SMITH, Ian, John [GB/GB]; 9 Elderswood, Rainhill, Prescot, Merseyside L35 4QY (GB). GRIFFITHS, John, Joseph, Dermot [GB/GB]; 4 Rochester Drive, Marsden Heights, Burnley, Lancashire BB10 2BH (GB). BRASSINGTON, Paul, Stuart [GB/GB]; 15 Pendle Fields, Fence, Near Burnley, Lancashire BB12 9HN (GB). CONNELLY, Patrick, Thomas [GB/GB]; Viewlands, 11 Snackgate Lane, Heighington, County Durham DL5 6RG (GB).</p>		9814778.8	8 July 1998 (08.07.98)	GB	9814771.3	8 July 1998 (08.07.98)	GB	9912972.8	4 June 1999 (04.06.99)	GB	<p>(74) Agent: SANDERSON, Nigel, Paul; Dibb Lupton Alsop, Fountain Precinct, Balm Green, Sheffield S1 1RZ (GB).</p> <p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report.</p> <p>(88) Date of publication of the international search report: 30 March 2000 (30.03.00)</p>	
9814778.8	8 July 1998 (08.07.98)	GB										
9814771.3	8 July 1998 (08.07.98)	GB										
9912972.8	4 June 1999 (04.06.99)	GB										
<p>(54) Title: EASY OPEN BAG</p> <p>(57) Abstract</p> <p>A plastic bag (200) includes a mouth which is covered by a closure flap (205). The closure flap (205) may be peeled back in order to open the bag, without damaging the wall of the bag in or at which the mouth is formed. The closure flap (205) is preferably attached to the bag (200) by means of a peelable adhesive (215) and preferably includes lines of weakness (216) along which the closure flap (205) may be torn. Variations of the bag include a base portion which includes a flat area on which the bag may stand stably.</p>												

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## INTERNATIONAL SEARCH REPORT

International Application No PCT, B 99/02049
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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 B65D33/18
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According to International Patent Classification (IPC) or to both national classification and IPC
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B. FIELDS SEARCHED
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Minimum documentation searched (classification system followed by classification symbols) IPC 7 B65D
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
---

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT
--

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 90 03 401 U (CITO-KUNSTOFFE UND VERPACKUNGSFOLIEN GMBH) 31 May 1990	1-4,6, 8-12,18, 25,26, 34-36
Y	see page 1, line 7 - page 3, line 23	5,7,14, 15, 19-21, 27-30
A	see page 4, line 9 - page 6, line 11 see page 4, line 9 - page 6, line 11; figures 1-5 ---	22-24
P,X	DE 297 19 685 U (KLAR PAUL GERHARD DR ING) 1 April 1999	1,13,16, 17,33
Y	see page 3, line 16 - page 4, line 23; figures 1-5 see page 3, line 16 - page 4, line 23; figures 1-11 ---	14,15, 19-21
		-/-

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Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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22 October 1999

13.01.00

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Papatheofrastou, M

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/ .3 99/02049

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3 782 622 A (MONTGOMERY R) 1 January 1974 see column 2, line 53 - column 3, line 10; figures 1-11 see column 2, line 53 - column 3, line 10; figures 1-12 ---	5,7
Y	WO 98 18674 A (BL MACCHINE AUTOMATICHE ;VETTORATO NATALE (IT)) 7 May 1998 see page 6, line 17 - page 7, line 15; figures 1-12 see page 6, line 17 - page 7, line 15; figures 1-13 -----	27-30
A		31,32

**INTERNATIONAL SEARCH REPORT**

International application No

PCT/GB 99/ 02049

**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

please see additional sheet!

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

- The additional search fees were accompanied by the applicant's protest.  
 No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International Application No. PCT/GB 99/02049

### FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-26,33-36

Bag with easy to make and use openable closure.

2. Claims: 27-32

Bag with base capable of standing upright in a stable manner.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT, 99/02049

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 9003401 U	31-05-1990	NONE	
DE 29719685 U	01-04-1999	NONE	
US 3782622 A	01-01-1974	NONE	
WO 9818674 A	07-05-1998	IT B0960550 A AU 4470297 A	30-04-1998 22-05-1998

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